



ECO201

Principles of

ECONOMICS

Course Manual

Adeola F. Adenikinju Ph.D.

Principles of Economics

ECO201



University of Ibadan Distance Learning Centre
Open and Distance Learning Course Series Development
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Vice-Chancellor's Message

The Distance Learning Centre is building on a solid tradition of over two decades of service in the provision of External Studies Programme and now Distance Learning Education in Nigeria and beyond. The Distance Learning mode to which we are committed is providing access to many deserving Nigerians in having access to higher education especially those who by the nature of their engagement do not have the luxury of full time education. Recently, it is contributing in no small measure to providing places for teeming Nigerian youths who for one reason or the other could not get admission into the conventional universities.

These course materials have been written by writers specially trained in ODL course delivery. The writers have made great efforts to provide up to date information, knowledge and skills in the different disciplines and ensure that the materials are user-friendly.

In addition to provision of course materials in print and e-format, a lot of Information Technology input has also gone into the deployment of course materials. Most of them can be downloaded from the DLC website and are available in audio format which you can also download into your mobile phones, IPod, MP3 among other devices to allow you listen to the audio study sessions. Some of the study session materials have been scripted and are being broadcast on the university's Diamond Radio FM 101.1, while others have been delivered and captured in audio-visual format in a classroom environment for use by our students. Detailed information on availability and access is available on the website. We will continue in our efforts to provide and review course materials for our courses.

However, for you to take advantage of these formats, you will need to improve on your I.T. skills and develop requisite distance learning Culture. It is well known that, for efficient and effective provision of Distance learning education, availability of appropriate and relevant course materials is a *sine qua non*. So also, is the availability of multiple platform for the convenience of our students. It is in fulfilment of this, that series of course materials are being written to enable our students study at their own pace and convenience.

It is our hope that you will put these course materials to the best use.



Prof. Isaac Adewole

Vice-Chancellor

Foreword

As part of its vision of providing education for “Liberty and Development” for Nigerians and the International Community, the University of Ibadan, Distance Learning Centre has recently embarked on a vigorous repositioning agenda which aimed at embracing a holistic and all encompassing approach to the delivery of its Open Distance Learning (ODL) programmes. Thus we are committed to global best practices in distance learning provision. Apart from providing an efficient administrative and academic support for our students, we are committed to providing educational resource materials for the use of our students. We are convinced that, without an up-to-date, learner-friendly and distance learning compliant course materials, there cannot be any basis to lay claim to being a provider of distance learning education. Indeed, availability of appropriate course materials in multiple formats is the hub of any distance learning provision worldwide.

In view of the above, we are vigorously pursuing as a matter of priority, the provision of credible, learner-friendly and interactive course materials for all our courses. We commissioned the authoring of, and review of course materials to teams of experts and their outputs were subjected to rigorous peer review to ensure standard. The approach not only emphasizes cognitive knowledge, but also skills and humane values which are at the core of education, even in an ICT age.

The development of the materials which is on-going also had input from experienced editors and illustrators who have ensured that they are accurate, current and learner-friendly. They are specially written with distance learners in mind. This is very important because, distance learning involves non-residential students who can often feel isolated from the community of learners.

It is important to note that, for a distance learner to excel there is the need to source and read relevant materials apart from this course material. Therefore, adequate supplementary reading materials as well as other information sources are suggested in the course materials.

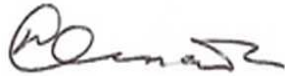
Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist you using convenient technology including Google Hang Out, You Tube, Talk Fusion, etc. but you have to take advantage of these. It is also going to be of immense advantage if you complete assignments as at when due so as to have necessary feedbacks as a guide.

The implication of the above is that, a distance learner has a responsibility to develop requisite distance learning culture which includes diligent and disciplined self-study, seeking available administrative and academic support and acquisition of basic information technology skills. This is why you are encouraged to develop your computer skills by availing yourself the opportunity of training that the Centre’s provide and put these into use.

In conclusion, it is envisaged that the course materials would also be useful for the regular students of tertiary institutions in Nigeria who are faced with a dearth of high quality textbooks. We are therefore, delighted to present these titles to both our distance learning students and the university's regular students. We are confident that the materials will be an invaluable resource to all.

We would like to thank all our authors, reviewers and production staff for the high quality of work.

Best wishes.

A handwritten signature in dark ink, appearing to read 'Okunade', with a stylized flourish at the end.

Professor Bayo Okunade

Director

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About this course manual

Principles of Economics ECO201 has been produced by University of Ibadan Distance Learning Centre. All Economics course manuals produced by University of Ibadan Distance Learning Centre are structured in the same way, as outlined below.

How this course manual is structured

The course overview

The course overview gives you a general introduction to the course. Information contained in the course overview will help you determine:

- If the course is suitable for you.
- What you will already need to know.
- What you can expect from the course.
- How much time you will need to invest to complete the course.

The overview also provides guidance on:

- Study skills.
- Where to get help.
- Course assessments and assignments.
- Activity icons.
- Study sessions.

We strongly recommend that you read the overview *carefully* before starting your study.

The course content

The course is broken down into study sessions. Each study session comprises:

- An introduction to the study session content.
- Learning outcomes.
- Content of study sessions with activities.
- A study session summary.
- Assessments.
- Bibliography

Your comments

After completing this course, Principles of Economics, we would appreciate it if you would take a few moments to give us your feedback on any aspect of this course. Your feedback might include comments on:

- Course content and structure.
- Course reading materials and resources.
- Course assessments.
- Course assignments.
- Course duration.
- Course support (assigned tutors, technical help, etc).
- Your general experience with the course provision as a distance learning student.

Your constructive feedback will help us to improve and enhance this course.

Course overview

Welcome to Principles of Economics ECO201

ECO 201 focuses on the analysis of two of the economic units in the society, the households and the firms. The course is micro in the sense that we concern ourselves with the behaviour of individual agents. It is quite different from macroeconomics where the focus of analysis is on the economy as a whole. This course will therefore afford you the opportunity of understanding the simple laws that characterize the workings of the modern market economy.

Principles of Economics ECO201—is this course for you?

ECO201 is a compulsory/prerequisite course to ECO301. It covers topics in microeconomics. This course presents factual material concerning the operation of the firm and household as well as the development of rudimentary understanding of economic decision-making.

Course Outcomes

After studying this course, you should be able to:

- *outline* the historical development of economics as a field of study.
- *point out* the basic source of economic problems faced by individuals and the society.
- *use* the basic tools of economic analysis.
- *analyse* how the interplay of forces of demand and supply determines the allocation of resources in the economy.
- *calculate* elasticity of demand and supply.
- *perform* manipulations with indifference curve.

Timeframe



How long?

This is a one semester course.

45 hours of formal study time is required.

Study skills



As an adult learner your approach to learning will be different to that from your school days: you will choose what you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a consequence, you will need to consider performance issues related to time management, goal setting, stress management, etc. Perhaps you will also need to reacquaint yourself in areas such as essay planning, coping with exams and using the web as a learning resource.

Your most significant considerations will be *time* and *space* i.e. the time you dedicate to your learning and the environment in which you engage in that learning.

We recommend that you take time now—before starting your self-study—to familiarize yourself with these issues. There are a number of excellent web links & resources on this Course Website. Go to “Self-Study Skills” menu in course website.

Need help?



Help

As earlier noted, this course manual complements and supplements ECO201at UI Mobile Class as an online course.

You may contact any of the following units for information, learning resources and library services.

Distance Learning Centre (DLC)

University of Ibadan, Nigeria

Tel: (+234) 08077593551 – 55

(Student Support Officers)

Email: ssu@dlc.ui.edu.ng

Head Office

Morohundiya Complex, Ibadan-
Ilorin Expressway, Idi-Ose,
Ibadan.

Information Centre
20 Awolowo Road, Bodija,
Ibadan.

Lagos Office
Speedwriting House, No. 16
Ajanaku Street, Off Salvation
Bus Stop, Awuse Estate, Opebi,
Ikeja, Lagos.

For technical issues (computer problems, web access, and etcetera),
please send mail to webmaster@dlc.ui.edu.ng.

Academic Support



A course facilitator is commissioned for this course. You have also been assigned an academic advisor to provide learning support. The contacts of your course facilitator and academic advisor for this course are available at onlineacademicsupport@dlc.ui.edu.ng

Activities



This manual features “Activities,” which may present material that is NOT extensively covered in the Study Sessions. When completing these activities, you will demonstrate your understanding of basic material (by answering questions) before you learn more advanced concepts. You will be provided with answers to every activity question. Therefore, your emphasis when working the activities should be on understanding your answers. It is more important that you understand why every answer is correct.

Assessments



There are three basic forms of assessment in this course: in-text questions (ITQs) and self assessment questions (SAQs), and tutor marked assessment (TMAs). This manual is essentially filled with ITQs and SAQs. Feedbacks to the ITQs are placed immediately after the questions, while the feedbacks to SAQs are at the back of manual. You will receive your TMAs as part of online class activities. Feedbacks to TMAs will be provided by your tutor in not more than 2 weeks expected duration. Schedule dates for submitting assignments and engaging in course / class activities is available on the course website. Kindly visit your course website often for updates.

Bibliography



Reading











For those interested in learning more on this subject, we provide you with a list of additional resources at the end of this course manual; these may be books, articles or websites.

Getting around this course manual

Margin icons

While working through this course manual you will notice the frequent use of margin icons. These icons serve to “signpost” a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this course manual.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.

			
Activity	Assessment	Assignment	Case study
			
Discussion	Group Activity	Help	Outcomes
			
Note	Reflection	Reading	Study skills
			
Summary	Terminology	Time	Tip

Study Session 1

Essentials of Economics

Introduction

In this Study Session, you will explore the historical development and meaning of economics. You will also examine the basic source of economic problems faced by the society. Lastly, you will be exposed to how economics is a science, and the basic tools of economic analysis.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 1.1 *outline* the historical development of economics as a field of study.
- 1.2 *define* the meaning of economics.
- 1.3 *point out* the basic source of economic problems faced by individuals and the society.
- 1.4 *show* how economics is a science.
- 1.5 *use* the basic tools of economic analysis.

1.1 Brief History of Economics

Economics The study of the allocation of scarce resources to meet unlimited human wants.

Economics is very primary to the lives of individuals and the society at large. In this central role, one can agree with Karl Marx, in describing economics as a foundation on which rests other superstructures, political, social, etc. of the society. The study of economics dates back to the time of Aristotle who described it as *oikonomique*. The classical economists treated economics as political economics. However, from the time of Alfred Marshall, economics assumed the specialised form for which it is known today. In other words, it attempted to remove itself from the value/ethical consideration and move more in the direction of scientific analysis.

ITQ

Question

- What is the earliest ideological form of economic reasoning?

Feedback

- Classical economics in which economics was treated as political economics.

1.2 The Meaning of Economics

Many economists have attempted to define economics from a narrow perspective and thereby leaving out the main substance of the subject matter. Aristotle considers economics "as the study of the household". Marshall defines it as the "study of mankind in the ordinary business of

life". Ardisson on his own defines economics as a social science which covers the action of individuals in the processing, exchanging and consuming of goods and services.

Although these definitions one way or the other deal with some aspects of the subject matter, they however leave out the central problems which are scarcity, choice, accumulation and capital utilization.

A more appropriate definition has been given by Lord Robbins. He defined economics as the "science which studies human behaviours as a relationship between **ends** and **scarce means** which have **alternative uses**.

The above definition is more relevant because it not only highlighted the role of economics as a science but also focuses on the major problems of economics.

ITQ

Question

- Define Economics.

Feedback

- Economics can be defined as the "science which studies human behaviours as a relationship between ends and scarce means which have alternative uses. This definition was given by Lord Robbins and it has been the most appropriate definition of economics.

1.3 The Source of Economic Problems

Factors of production The inputs used in production process.

Every society is endowed with human and natural resources. These resources include, land (a free gift of nature), labour, capital and entrepreneur. These resources are collectively referred to as **factors of production**. It is these resources that are combined by producers to produce **commodities**.

Commodities

The outputs of a production process.

Commodities can be broadly divided into goods and services. Goods are tangible such as television, pressing irons and cars; while services are intangible. Examples of these include, insurance, hair-cut, and teaching. When we sum up all the commodities which are produced in a given country over a period of time, we have what is commonly referred to, as Gross National Product.

As all of us are aware, we do not desire goods and services for their own sakes, rather we desire them because they help us in satisfying our wants. Thus, the whole essence of production in our economy is the satisfaction of human wants (or consumption).

However, looking around us today will make us realize that the available resources cannot totally satisfy our wants. The more we satisfy certain wants, the more we desire better things. Practically speaking, we all desire better foods, clothing, housing, cars and other good things of life. Though we say human wants are unlimited, we also know that the resources needed to satisfy these wants are finite or limited. For instance,

Scarcity Insufficient supply of a thing.

Scale of preference A system of classification in which things are ranked progressively according to a specific criterion.

Opportunity cost The next best alternative that must be foregone as a result of a particular decision

while we all desire good cars not everybody can afford one. This therefore gives rise to one of the basic problems encountered in most aspects of economics, the problem of **scarcity**.

The divergence between wants and resources make choice inevitable. Because it is impossible to satisfy all our wants, we have to satisfy some and leave others unsatisfied. Thus, a mechanism is needed to choose which of our wants that must be presently satisfied. The satisfaction of some wants implies the sacrifice of others. A means of determining which of the wants to satisfy is by constructing a **scale of preference** where wants are arranged in descending order of their importance. A rational consumer will prefer to satisfy the most pressing needs before going to less pressing ones.

The act of sacrificing one want for the satisfaction of the other one is called **opportunity cost** or **real cost**. Let us consider a practical example here, if an individual is faced with the option of buying either a textbook or a sandal because he cannot afford the two. And he eventually buys the textbook, the sandals which he had foregone is called the opportunity cost of the textbook.

Hint

Opportunity cost is sometimes defined as the alternative forgone.

On a larger scale, firms and governments also engage in this process. The firms make a choice between the production of a type of commodity or the other. For example, a firm may want to decide between using a capital-intensive means of production or labour intensive one. The one it eventually chooses will have a real cost.

The provision of services by the government also involves opportunity cost, If government decides to build more schools, and finds the necessary money by cutting down on defence expenditure. The latter that is foregone is the opportunity cost of building more schools.



Reflection

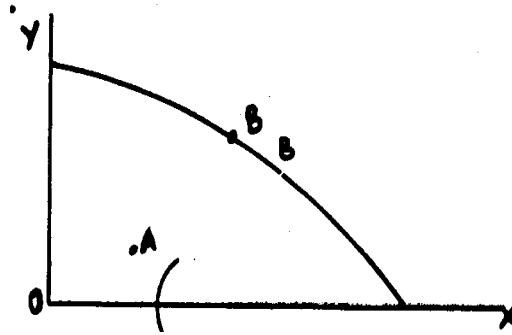
Do you see that because human wants are unlimited and the means to satisfy them are scarce, a choice has to be made and this gives rise to opportunity cost?

1.3 Basic Economic Problems

Every economy - capitalist or socialist - is faced with resolving six basic economic questions. The manner by which they resolve these questions highlights the similarities and differences between different **economic systems**.

1. Determining whether the resources of the country are being fully utilized, or otherwise. Each country has a production possibility Frontier (PPF) which determines the maximum output of commodities which the country can produce if it is operating its resources efficiently.

Fig 1.1 Production Possibility Frontier

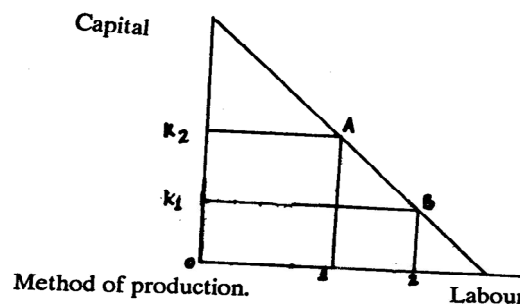


If a country is inside the boundary of the curve, say for example, at point A then this implies that some of its resources are idle or inefficiently utilized. On the other hand, if the country is at point B, i.e. on the curve, there is optimal utilization of resources.

However, it is a point of fact that most economies are inside their PPF. This is why we have unemployment problems in all economies of the world. It is the responsibility of economists to find how this problem can be solved.

2. Determining which commodities to produce and in what quantities? This is the allocation of scarce resources among alternative uses. In a free-market economy (or capitalist economy), what to produce and in what quantities are determined by the price mechanism. On other hand, in a socialist economy, it is the central government that would determine what to produce.
3. Determining what methods of production to use in producing these commodities. There are two methods of production, labour-intensive or capital-intensive. When for example, more of labour relative to capital is used in production, and then we say that the production process is Labour-intensive and vice-versa. A society might decide to use more of labour or capital resources depending on the proportion of the available resources at her disposal.

Fig 1.2 Method of Production



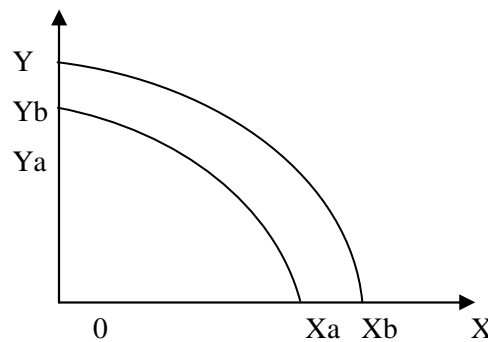
At point 'A' more of capital is used while at B' more unit of labour is used.

4. Determining for whom the goods are to be produced. That is those who consume the goods produced. In real life, we know that few people consume disproportionately large output of the society while the bulk of the society has to take the remaining. The economic explanation for this has since the time of Adam Smith been of major

concern for economists. In socialist economies, the government often interferes in the economy to correct the lopsidedness in resource distribution.

5. Determining whether production and distribution system of the society is efficient. In economic sense, we say production is efficient if it is impossible to relocate resources in such a way as to produce more of one commodity without producing less of others. The commodities so produced are said to be efficiently distributed if it will be impossible to redistribute them among the individuals in the society and make at least one person better off without simultaneously making someone else worse off.
6. Determining whether the country's capacity to produce output is growing overtime or if it is static. In this case, economists are concerned with how to shift the PPF of the economy. This is what we refer to as economic growth.

Fig 1.3 The upward shifting of the PPF by economic growth



ITQ

Question

- Why do human beings desire goods and services?

Feedback

- Human being desire goods and services in order to derive satisfaction.

1.4 Economics: a Science Subject?

Generally, economics is often regarded as a science subject. However, a distinction is made between physical science and social science. Physical science refers to biological or natural sciences, such as, physics, chemistry and biology. Economics is not a physical science but a social science. This is because it is a scientific study of human beings.

Economics is regarded as a science because its method of analysis is that of science. Science involves the formation of hypothesis about reality. However, in order to be able to validate such hypothesis observations are generated that will provide evidence for or against any hypothesis that we wish to test. While such tests are usually carried out in laboratory settings in the physical sciences, this is very difficult to do in economics. But all the same, data are collected on the subject of interest and statistical and mathematical tools are then used to see whether available data confirms

the predictions of the hypothesis. Thus, economics is regarded as scientific in as much as it attempts to relate question to evidence.

ITQ

Question

- Highlight the distinctive features of economics as a science subject.

Feedback

- Economics is treated as a science subject because it has the following features:
 - observes the real world phenomena
 - collects data on observation
 - formulates and tests hypothesis
 - validate results
 - make predictions from the results

1.5 Tools of Economic Analysis

In economics, two methods of analysis are often used. They are:

1. functional representation, and
2. logical influence.

1.5.1 Concept of Functional Relationship

This is a situation where economic relationships are represented visually by graphical methods or symbols (mathematical approach).

$$S = f(p) \text{ ----- (1)}$$

Supply is a function of price that is supply depends on price

$$C = f(y) \text{ ----- (2)}$$

Consumption is a function of income.

These are general functions in the sense that we are not specific as to the nature of the relationship between the dependent and the independent variables in (1) and (2).

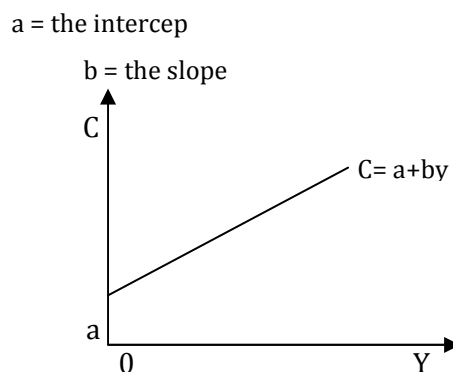
If $C = a + by$. This is specific

C = dependent variable

y = independent variable

a and b are called the parameters of the function

Fig 1.4 Graphical relationship between C and Y



1.5.2 Logical Influence

This is alternatively referred to as logical deduction or theorizing and economic investigations. In this latter method, we formulate a theory and then test this theory against real world situations. Six steps are involved in formulation of a theory. These are:

- a. Identification of problem;
- b. Assumptions about the phenomenon;
- c. Formulation of theories;
- d. Verification;
- e. Correction if need be; and
- f. Application.

Often Economic theory is based on relations between magnitudes and variables. Variables in economic analysis are categorized into two: endogenous and exogenous variables.

Endogenous and Exogenous Variables

Endogenous variables are the ones, which have their explanation in the theory that is in focus. It can be known with the model under consideration. Exogenous variables have their explanation outside a model. The relationship among variables whether exogenous or endogenous variables can be expressed mathematically by the concept of functional relationship.

ITQ

Question

Distinguish between functional representation and logical influence.

Feedback

Functional representation is the mathematical or graphical representation of relationship among economic variables while logical influence is the formulation of theories about economic variables.

Hint

These two methods of analysis - functional representation and logical influence - are usually employed in any study of economics.

Study Session Summary

**Summary**

In this Study Session, you learnt that economics is a science which studies human behaviour as a relationship between ends and scarce means, which have alternative uses. Basic concepts that underline the study of economics are: scale of preference, scarcity, choice and opportunity cost. Every economy is faced with resolving some basic economic questions, but the manner by which they resolve these questions highlights the similarities and differences between different economic systems. Economics is regarded as science because it involves the formation of hypothesis about reality.

Assessment

**Assessment****SAQ 1.1 (tests Learning Outcome 1.1)**

Briefly describe the historical development of economics as a field of study.

SAQ 1.2 (tests Learning Outcome 1.2)

How is economics defined overtime?

SAQ 1.3 (tests Learning Outcome 1.3)

Highlight the basic source of economic problems faced by individuals and the society.

SAQ 1.4 (tests Learning Outcome 1.4)

Give reasons why economics is being described as a science subject.

SAQ 1.5 (Tests Learning outcome 1.5)

What are the basic tools of economic analysis?

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**Reading**

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Study Session 2

Price Theory and the Theory of Demand and Supply

Introduction

In the previous Study Session, you examined the subject matter of economics. In this Study Session, you will explore the process of market mechanism.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 2.1 *highlight* the economic agents in a market.
- 2.2 *analyse* how the interplay of forces of demand and supply determines the allocation of resources in the economy.
- 2.3 *determine* prices in a free market.

2.1 Economic Agents and the Institution of the Market

2.1.1 Economic Agents

It is possible to identify three principal agents in an economy. These are: households, firms and central authorities.

Household is the smallest economic unit. The main objective of the household is to maximize its satisfaction. All decisions in the household are geared towards the fulfilment of this objective. In addition, it is assumed that all resources in the economy are owned by the household.

Firm is the second principal agent in the economy. They are charged with the responsibility of turning inputs into outputs of goods and services. They do this by purchasing resources from the households. The goal of the firms is the maximization of their profits.

Central authorities embody all the agents and institutions of the government. That is, the police, the civil service, public corporations and other bodies owned or under the control of the government.

ITQ

Question

- Itemize the principal agents in an economy

Feedback

- These are: household, firm, and central authorities.

2.1.2 Market

If you are asked what a **market** is, the natural answer that will come to your mind is that it is a place where buyers and sellers come together to transact business. However, this definition is highly restrictive. The benefit of civilization has made it possible to look beyond this narrow definition of the market. It is now possible for transactions of the market to be carried out across international borders. Thus, market can be defined as *an area over which buyers and sellers negotiate the exchange of a well defined commodity*.

Public versus Private Sector

The public sector refers to all production activities that are in the hands of the public while private sector refers to all production that are in private hands. The distinction between the two is a function of the ownership of means of production. In the private sector, organization of production revolves round the individuals and firms, and in the public sector, it is owned by the state. The predominance of either the public or private sector in an economy determines the nature of the economy system. The Socialist system is characterised by the dominance of the public sector while in the Capitalist system it is the other way round.

ITQ

Question

- In which economy system do we have the dominance of private sector?

Feedback

- Capitalist system.



Tip

The distinction between public sector and private sector is a function of the ownership of means of production. In the private sector, organization of production revolves round the individuals and firms, while in the public sector, it is owned by the state.

2.2 The Elementary Theory of Demand and Supply

In a free market economy, the interplay of the forces of demand and supply determines the allocation of resources in the economy. Hence, it will be useful to have a basic understanding of the nature of these forces and their interplay in order to have a good grasp of the economy.

2.2.1 The Nature of Demand

Demand is the amount of a commodity that consumers are willing and able to buy at a given price and over a period of time. Two things immediately come to mind here. First, is the notion of effective demand which simply means demand backed by ability to pay? This separates demand from ordinary wants. The second thing which comes to mind is that demand is a flow concept. It encompasses the dynamism of time. Demand is only meaningful when it is related to a given period of time

say a week, a month, a year, etc.

It is also useful to distinguish between individual demand and market demand. While the former term is very clear, the later term simply refers to a horizontal summation of all individual demand curves.

Factors Influencing Demand

Various factors determine the quantity of a commodity consumers are willing and able to buy over a given period of time. These factors include:

1. Price of the commodity
2. Prices of other related commodities
3. Size of the household income
4. Tastes and Fashion
5. Population size of the society
6. Income distribution.

We can formulate the above relationship between demand and factors influencing it in a formalized manner. This is called demand function. It can be expressed as:

$$q_n^d = D(P_n, P_1, \dots, P_{n-1}, Y, T, X, Y_D)$$

Where q_n^d is the quantity demanded of commodity n ;

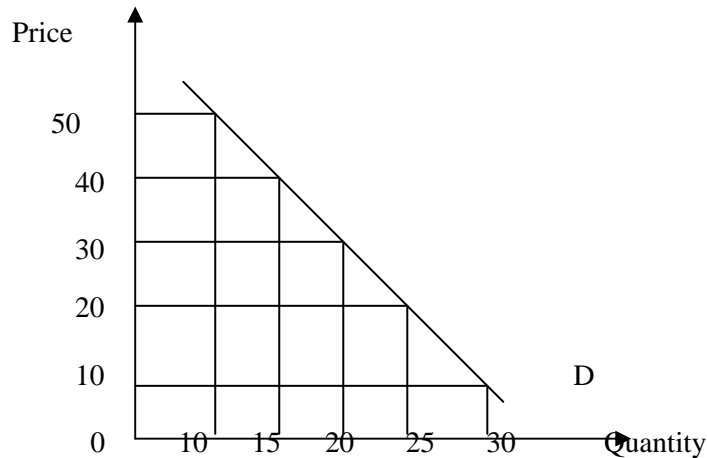
P_n is the price of the commodity, $P_1 \dots P_{n-1}$ is a shorthand notation for the prices of other commodities, Y is household's income, T , tastes of the household members, X is the population, and Y_D is the distribution of income in the society.

At this juncture, we shall digress and examine a typical demand curve and its characteristics. The table below shows a hypothetical relationship between the price of oranges and the quantity demanded.

Table 2.1 A household's demand schedule of oranges

Price (₹)	Quantity demanded (per month)
10	30
20	25
30	20
40	15
50	10

Fig 2.1 A household's demand curve for oranges



The demand curve shows at a glance the price-quantity relationship. For instance from Fig. 2.1, we can see that when price per ton of oranges is ₦50.00, 10 oranges were purchased per month. Quantity however rose to 30 when the price fell to ₦10.00 per ton.

This functional relationship expressed by the demand curve can be written as

$$Q_{do} = f(P_o)$$

That is, quantity demanded of oranges is a dependent function of the price of oranges.

This functional relationship however assumes that other factors affecting demand such as income, tastes, etc are held constant.

Characteristics of Demand Curve

There is an inverse relationship between demand and price. That is to say, when price falls, quantity demanded increases and vice-versa. This makes the demand curve to be downward sloping. The reasons for this are obvious.

1. When price falls, more people who were unable to purchase the commodity at a higher price can now afford it.
2. Those who are already buying might increase the quantity they purchase. (Note that when price falls, marginal utility becomes greater than price, hence to equalize them, households need to increase their demand).
3. If the good has a substitute, people might buy less of the substitute and now consume more of the good.

Factors Affecting Demand

Earlier on in this chapter, we enumerated the factors that affect quantity demanded. A brief discussion of these factors at this juncture might be appropriate.

1. **Price of the commodity:** As we have seen in our earlier discussion, there is an inverse relationship between price and quantity

demanded. When the price of a commodity falls, the quantity demanded of the commodity will increase, all things being equal. This relationship is pictorially summarised in Fig. 2.1.

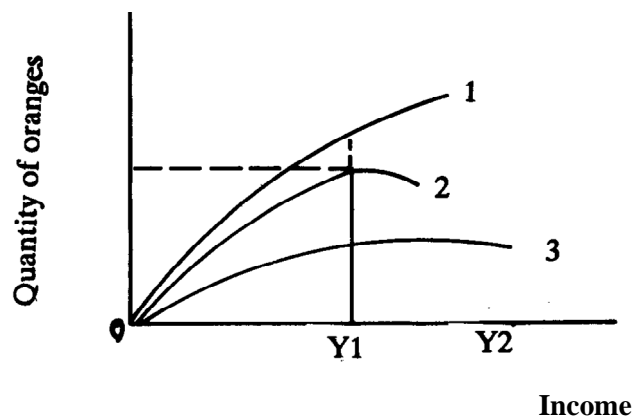
2. **Prices of other related commodities:** For any two different commodities, there are two possible relationships. Either they are substitutes or complements. One example of each here will suffice. Fish and meat can be regarded as substitutes while petrol and car are complements. Whereas there is no direct relationship between biro and fish, however, when the price of fish increases relative to meat consumers will shift to meat and vice versa. However, for complements, for example, car and petrol, a fall in the price of car will lead to increase in the demand for car and by extension petrol. Hence, there is a negative relationship between the price of one and the quantity demanded of the other complement good.
3. **The size of the household's income:** Ordinarily we would expect a rise in income to be associated with a rise in the quantity of goods demanded. Commodities that obey this rule are called **normal goods**.



Two possible exceptions need to be noted. In some cases, a change in income might leave the quantity demanded completely unaffected. This is especially true when the consumer has been satiated. In the case of the other commodities, it is possible for a rise in income beyond a certain level to lead to a fall in the quantity that the household demands. This is particularly true of **inferior goods** like potatoes, gari, etcetera.

The three cases enumerated above are shown in the curves below.

Fig 2.2 The relationship between the quantity of oranges demanded and household income



- **Curve 1** is the case of normal goods.
- **Curve 2** illustrates the case of inferior goods.
- **Curve 3** represents a situation where income no longer affects demand after Y_2 .

4. **Tastes and Fashion:** Tastes and fashions change with time. When taste change in favour of a particular commodity, then demand for such commodity will increase. For instance, when in the '70's it was fashionable for women to wear wigs, the demand for wigs shot up.
5. **Population size:** The size and distribution of the population also affects demand. For a big country, the total demand for commodities

will be higher than that of a small country.

6. **Distribution of Income:** If income is evenly distributed, there will be greater demand for commodities than when it is skewed to a particular income group.

ITQ

Question

- Highlight the factors that affect demand for a commodity in the market.

Feedback

- Factors that affect demand for a commodity in the market include:
 - Price of the commodity
 - Price of other related commodities
 - The size of household income
 - Taste and fashion
 - Population size
 - Distribution of income

Changes in Demand

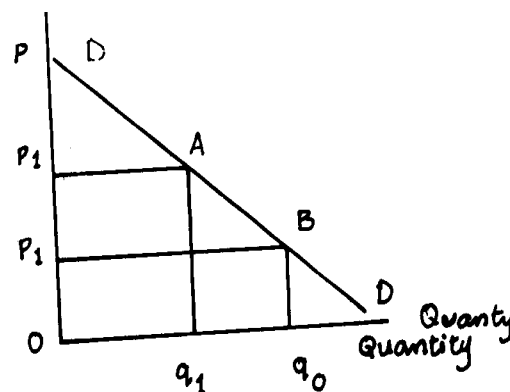
There are two basic changes in demand. These are:

- i. Change in quantity demanded, and
- ii. Change in demand

Change in quantity demanded

This involves the movement along the demand curve. The motivating factor here is the price of the commodity with all other factors affecting demand being held constant. For instance in Fig 2.3, movement from point A to B.

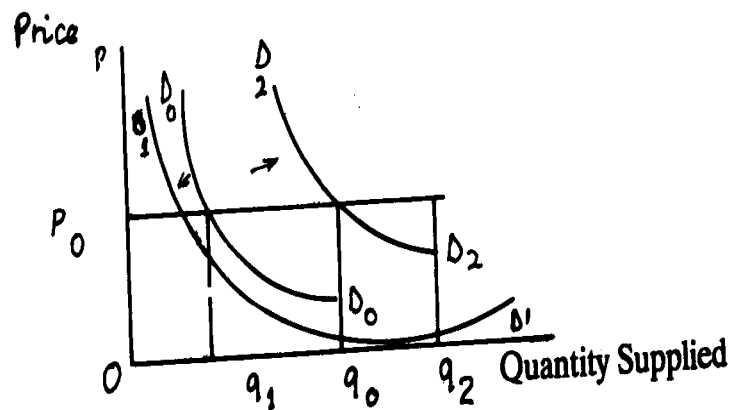
Fig 2.3 Movement along a demand curve



Change in Demand

Unlike change in quantity demanded, change in demand involves the shift in demand curve either outward or inward. See Fig.2.4.

Fig 2.3 Shift in demand curve



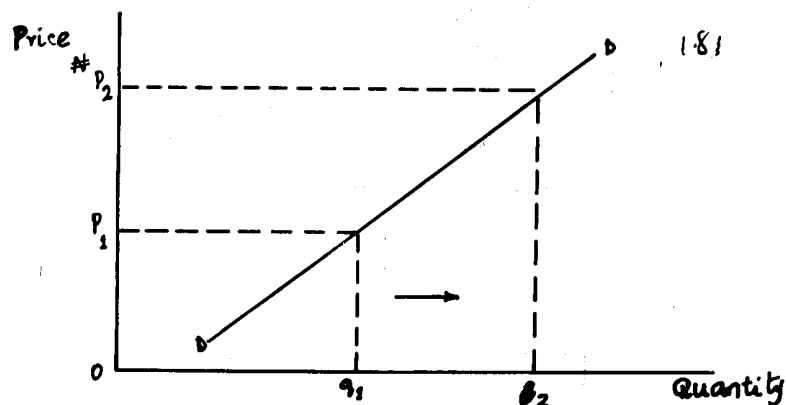
Note

In the case of a change in demand, price is kept constant while other factors affecting demand are allowed to vary, e.g. income, taste, population size, etc.

Exceptional Demand Curve

The first law of demand and supply states that the lower the price, the greater the quantity demanded of a commodity and vice-versa. However, there are some situations and commodities which do not conform to this 'law'. In other words, the above law is modified to read "the higher the price, the greater the quantity demanded". In such cases, the demand curve is upward sloping. (See figure below).

Fig 2.5 Exceptional Demand Curve



In Fig. 2.5, when price increase from P_1 to P_2 the quantity demanded of a commodity also increased from q_1 to q_2 . Various reasons have been adduced to account for this strange behaviour. Such reasons include: Ostentatious purpose, given goods, and expectation of future rise in price.

2.2.2 Elementary Theory of Supply

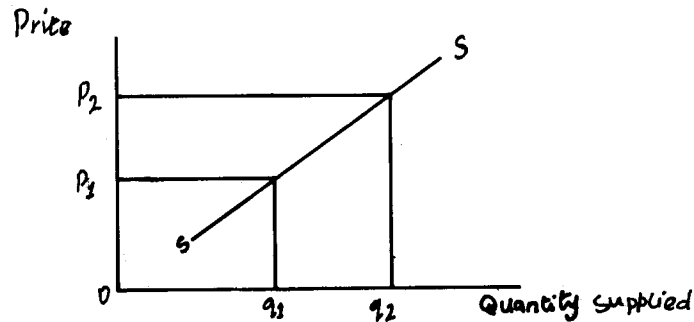
Supply refers to the amount of a commodity producers are willing and able to offer for sale at the market ruling price over a given period of time. Like demand, supply is a flow concept.

Factors Influencing Supply

Several factors influence supply of a commodity. These include the following:

1. **The Price of that Commodity:** As the price of the commodity increases there will be an increase in the quantity supplied and vice versa. This is so because the goal of the supplier is profit maximization. The relationship between price and quantity supplied is direct. The higher the price, the higher the quantity supplied and vice versa.

Fig 2.6 The Supply Curve



2. **Prices of other Commodities:** As the price of other commodities increases, production of the commodity whose price does not rise becomes less attractive than it was previously. Hence, ceteris paribus, the supply of the commodity will fall as the prices of other commodities rise.
3. **The Prices of Factors of Production:** An increase in the price of a factor of production will increase the cost of production of goods that makes use substantially of that factor and only a small increase in the cost of producing those commodities that use a small amount of such factors. This will therefore change relative profitability of different lines of production. This will cause producers to shift from one line to another and so cause changes in the quantities of the various commodities that are supplied.
4. **The Goals of Firms:** If producers of some commodities wants to sell as much as possible, even if it costs them some profits to do so, more will be offered for sale than if they wanted to make maximum profits. If producers are reluctant to take risks, we would expect smaller production of any good whose production is risky.
5. **The State of Technology:** Improvement in methods of production automatically leads to increase in output. With modern pace of industrial development there is now increased and varied output of all goods.

All these factors influencing supply can also be functionally represented:

q^n_s	=	quantity supplied of commodity n
P_n	=	Price of the Commodity.
$P_{i... n-l}$	=	Price of other commodities
P_f	=	Price of factors of production
T_e	=	technology

Therefore $q^n_s = S(P_n, P_{i... n-l}, P_f, T_e)$

To derive a supply schedule and curve, the equation in the above Hint section will be reduced to $q^n_s = f(P_n)$ where $P_i, ..., n-l, P_f, T_e$ are all constant,

Hint

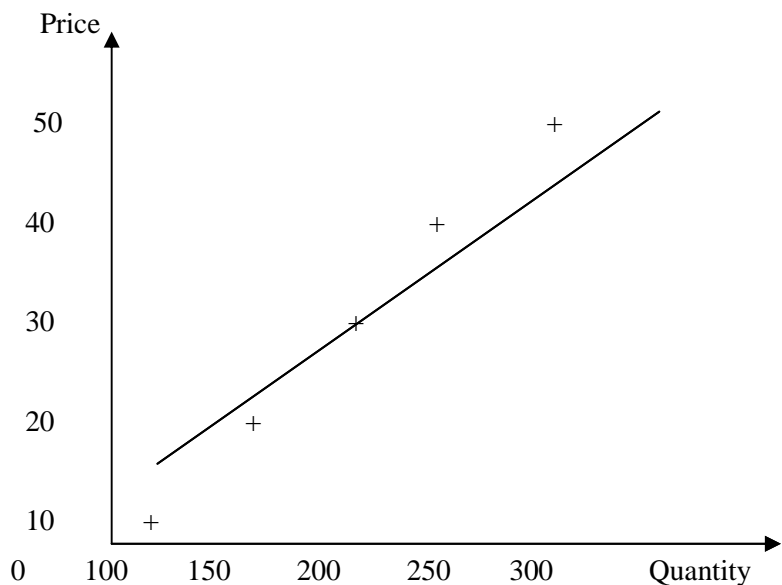
The table below represents a hypothetical supply of oranges over a month.

Table 2.2 Supply schedule of oranges for a month

Price (₹)	Qs/Kg
10	100
20	150
30	200
40	250
50	300

The corresponding supply curve is as shown below:

Fig 2.7 Supply curve of oranges



Supply curve shows a direct relationship between prices and quantity supplied. That is, the higher the price, the greater the quantity supplied and vice versa. This is the second law of demand and supply

Change in Supply versus Change in Quantity Supply

As in demand, there are also two basic changes in supply. The first is the change in supply which is the shift of supply curve either forward or backward. This shift is however independent of own-price change. It is elicited by other factors affecting demand other than the price of the commodity itself. (Fig.2.7a).

A change in quantity supplied results in different quantities of the commodities being supplied at different prices, other factors remaining constant. This change in quantity supplied leads to a movement along the same supply curve. Fig.2.7b.

Change in quantity supplied
supply

Change in

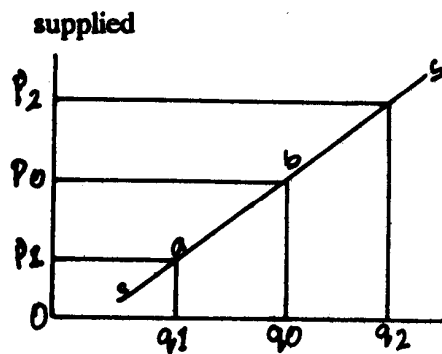


Fig. 2.7b Change in quantity supplied

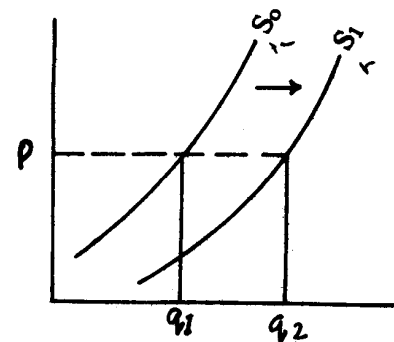


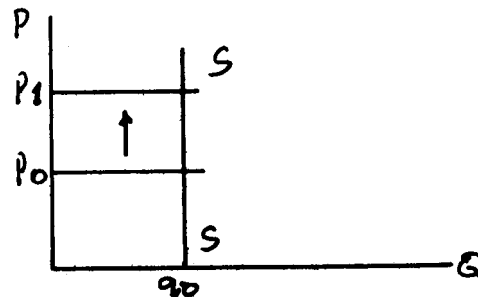
Fig. 2.7a Change in supply

Exceptional Supply Curves

Whereas a normal supply curve slopes upward from left to right, we sometimes have a supply curve that does not follow this pattern.

Fixed Supply Curves: In this case, a change in price does not elicit supply response, this is particularly true of those goods whose supply cannot be increased. E.g. land. See Fig 2.8.

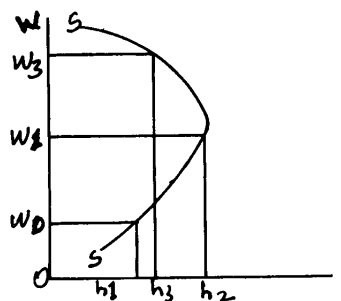
Fig 2.8 A fixed supply curve



Backward Bending Supply Curve: This depicts the response of labour to changes in wage rates. Initially, a worker would tend to work more when his present wage is increased. However, increase over time will actually make the worker to prefer leisure to work since by working fewer hours he will still be comfortable.

Fig 2.9 Supply of labour

Wages



24 hours labour/leisure

2.3 Determination of Market Price

At this juncture, we need to bring together our knowledge of demand and

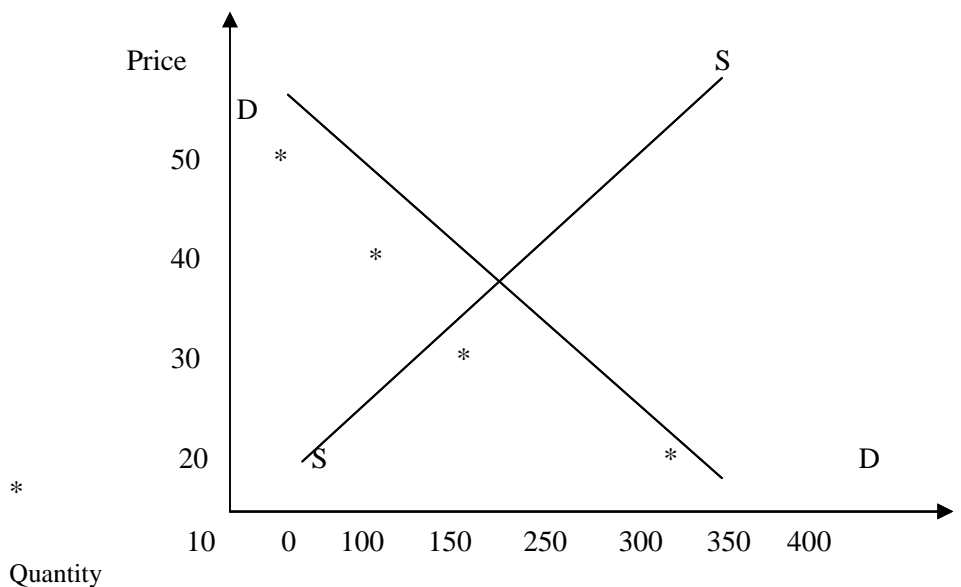
supply in order to determine the market equilibrium price. The objective of economics is to achieve market clearance. At equilibrium, the market is stable.

Using our various examples of Demand and Supply, we have

Price(₦)	Quantity Demanded	Quantity Supplied
50	100	400
40	150	350
30	250	250
20	300	200
10	350	150

Putting the above information in a diagram we have

Fig 2.10 Equilibrium price determination



Thus for any price other than ₦30.00 equilibrium will not be achieved in the market. Thus ₦30.00 is called the **equilibrium price** which is a general term referring to the price at which quantity demanded equals quantity supplied. The amount that is bought and sold at the equilibrium price is called the **equilibrium quantity**. The equilibrium point is both stable and unique.



Equilibrium price is determined at the intersection of demand and supply curves. At this equilibrium price, there is no excess demand or excess supply, demand is exactly equal to supply

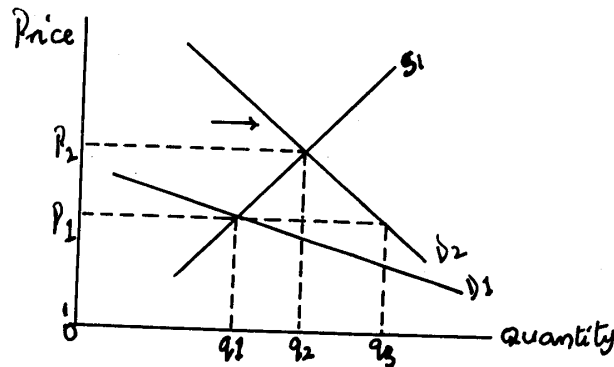
Shifts in Demand and Supply

It is relevant at this juncture to examine the effects of shifts in either the demand or the supply curve on price and quantity.

We will start by considering an increase in demand. In Fig. 2.11, the

original demand and supply curves are D_1 and S_1 respectively. The corresponding price and quantity are P_1 and q_1 . Now assume that the demand curve shifts to D_2 .

Fig 2.11 The effects of shifts in demand curve



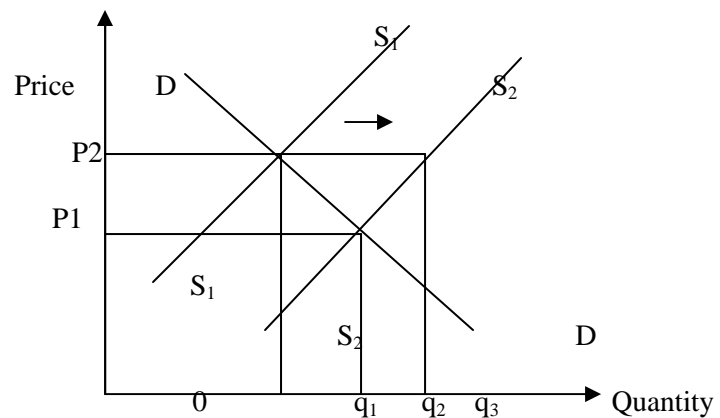
With this shift in demand, excess demand ($q_3 - q_1$) develop at price p_1 , this therefore forces the price up until equilibrium is achieved at price P_2 and demand falls to q_2 . When this price is attained, quantity demanded once again equals the quantity supplied. This analysis establishes our first implication concerning the effects of shifts in demand and supply curves. A rise in the demand for a commodity carries on increase in both the equilibrium price and the equilibrium quantity bought and sold and vice-versa. The effect of a rise in supply is shown in fig. 2.12. Perturbed

In the figure 2.10 above, demand and supply are only equal when price is ₦30.00. At this price, quantity demanded and quantity supplied equal 250. At this point, the quantity the sellers are willing to sell equal to the quantity the buyers are prepared to buy. In this situation the market is cleared and excess demand and supply are zero. At any other price above or below ₦30.00, there is excess supply or excess demand respectively. When there is excess demand, households will be unable to buy all they demand; when there is excess supply, firms will be unable to sell all they wish to supply. In both cases there is no harmonization of activities. *However, in such a situation, traditional economists believe that equilibrating forces will be thrown into action and bring about equilibrium.*

When there is excess supply, producers unable to sell all they brought into the market will be forced to reduce their prices. As they reduce their prices, demand will increase and this will continue until price falls to ₦30.00, in which case demand will be equal to supply.

On the other hand, when there is excess demand, for example, at price ₦20.00 demand is greater than supply. This will make households to compete among themselves offering higher prices. These higher prices would induce supplies.

Fig 2.12 The effects of shifts in the Supply Curve



The shift in the supply curve is to the right, from S_1 to S_2 indicating an increase in supply. At each price more is now offered for sale than was previously offered. This time, however, the shift of the curve causes a glut to develop at the old equilibrium price. When the curve shifts the quantity offered for sale increases from q_1 to q_3 but the quantity demanded remains unchanged at q_1 . The excess supply causes price to fall. The fall in price causes supply to diminish and demand to expand; this process continues until equilibrium is again achieved at price P_2 and quantity demanded and supplied are equal at q_2 . This gives us our second implication: A rise in the supply of a commodity causes a decrease in the equilibrium price and an increase in the equilibrium quantity bought and sold.

ITQ

Question

- What is the relationship between quantity demanded and quantity supplied at equilibrium?

Feedback

- At equilibrium point in the market, quantity demanded is equal to quantity supplied. The price at this point is referred to as equilibrium price.

Study Session Summary



Summary

In this Study Session you learnt that demand is the amount of a commodity that a consumer is willing to buy at a given price over a period of time. Several factors influence the amount of a commodity demanded by consumers. Such factors include: the price of the commodity, prices of other related commodities, income of the consumers population, taste and fashion, etc.

You also learnt that supply, on the other hand, is the amount of a commodity that sellers, are willing to sell at a given price over a period of time. Several factors also affect supply. These are: price of the commodity, prices of other commodities, cost of production, weather, etc. You are also made aware of the exceptional types of supply curves we have, i.e. the fixed supply curve, the backward sloping supply curve, and expectation to future rise in price.

Assessment



Assessment

SAQ 2.1(test Learning Outcome 2.1)

Mention the three principal economic agents in the market.

SAQ 2.2 (test Learning Outcome 2.2)

Describe how the forces of demand and supply determine the allocation of resources in the economy.

SAQ 2.3 (test Learning Outcome 2.3)

Discuss how price is determined in the free market.

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Study Session 3

The Theory of Consumer Demand

Introduction

Going by our interaction in Study Session two, the laws of demands and supply states that when price changes quantity demanded and supplied will also change, *ceteris paribus*. What this law fails to tell us however is the extent of change of either quantity demanded or supplied to a little change in price. In this Study Session therefore, we shall extend our knowledge of economics further to include the elasticity of demand and supply which tries to measure the degree of responsiveness of demand and supply to a change in price.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 3.1 *calculate* elasticity of demand.
- 3.2 *calculate* elasticity of supply.
- 3.3 *highlight* the factors which affect elasticity of demand.

3.1 Demand Elasticities

3.1.1 Price Elasticity of Demand

Price elasticity of demand is defined as the responsiveness of demand to a little change in price. In other words, we are interested in knowing by what percentage demand will change if price is changed by a given percentage.

Price elasticity is usually symbolized by the letter η , and it can be defined in equation form as:

$$\eta = (-1) \frac{\text{Percentage change in quantity demanded of Commodity x}}{\text{Percentage change in price of Commodity x}}$$

This is the percentage method. The formula can be simplified thus:

$$\begin{aligned} & \frac{\text{New demand} - \text{Initial demand}}{\text{Initial demand}} \\ & \frac{\text{New price} - \text{initial price}}{\text{Initial price}} \\ & = \frac{-\Delta^q/q}{\Delta^p/p} = \frac{\Delta q}{\Delta p} \frac{p}{q} \end{aligned}$$

Hint

Negative sign (-) is introduced in the formula in order to avoid a negative solution. In other words, to avoid dealing with negative numbers we multiply the equation by (-1).

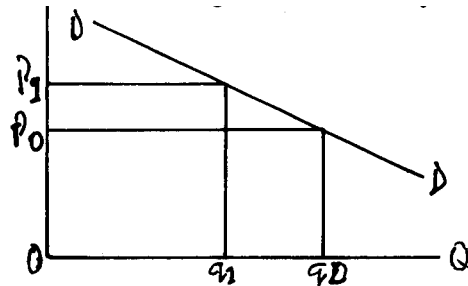
Types of Price Elasticity of Demand

There are various types of price elasticity of demand. These include:

Elastic Demand

This occurs when a little percentage change in price brings about a greater percentage change in quantity demanded. That is, the numerical value of η is greater than unity.

Fig 3.1 Fig. 3.1 Elastic Demand Curve

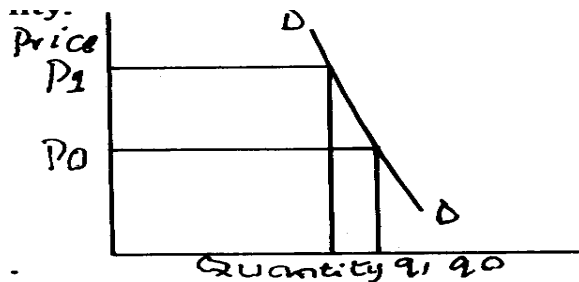


In the figure above, a little change in price ($P_1 - P_0$) has brought about a greater quantity change ($q_1 - q_0$). Examples of goods with elastic demand include durable goods like cars, shoes, etc.

Inelastic Demand

This occurs when a percentage change in price brings about a lesser percentage change in quantity demanded. Here the value of η is less than unity.

Fig 3.2 Inelastic Demand Curve

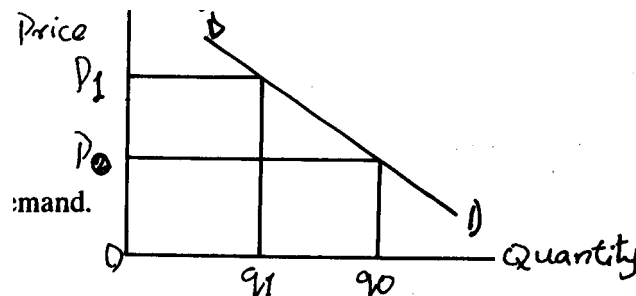


Examples of commodities with inelastic demand include salt, matches, cigarettes, etc.

Unitary Elasticity Demand

This occurs when a percentage change in price brings about the same percentage change in quantity demanded. In this case, η assumes the value of unity.

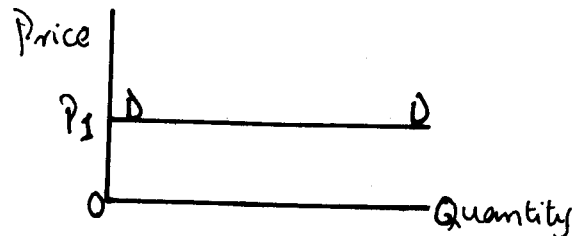
Fig 3.3 Unitary elasticity demand



Perfectly Elastic Demand

This is also known as completely or infinitely elastic demand. The consumers in this case are prepared to buy all they can see or find at price P_1 and none at all at a price slightly higher than P_1 . It is perfectly elastic since a small change in price will bring about an infinitely large change in demand. The value of η in this case is infinite.

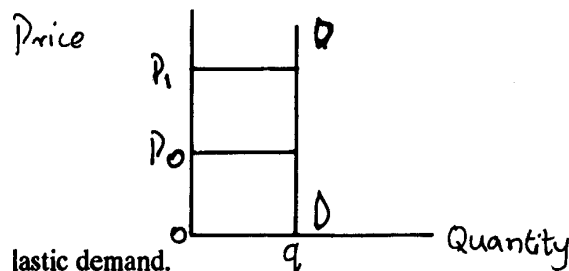
Fig 3.4 Perfectly Elastic Demand



Perfectly Inelastic Demand

Here a given percentage change in price brings about no change in quantity demanded. In this case, the consumer is perfectly satiated and a change in price will not have effect on its demand. The numerical value of η is zero.

Fig 3.5 Perfectly Inelastic Demand Curve



lastic demand.



Activity 3.1

How will you derive the elasticity of demand for bread in the table below?

Table 3.1 Changes in Prices and Quantities for two Commodities

Commodity	Initial Price (₦)	New Price (₦)	Initial Quantity	New Quantity
Bread	₦40.00	₦60.00	500	300
Cigarette	₦10.00	₦25.00	20	18

Feedback

Using our elasticity formula to derive the elasticity of demand for bread:

$$\eta = (-1) \frac{\Delta q/q}{\Delta p/p}$$

$$\eta = (-1) \frac{300 - 500/500}{60 - 40/40} = (-1) \frac{-200/500}{20/40}$$

$$\eta = (-1) \frac{-200 \times 40}{500 \times 20} = \frac{4}{5}$$

$$= 0.8 \text{ (inelastic)}$$

However, the above is for an increase in the price of bread. For a fall in price in which case the initial price and quantity of bread are ~~₦~~60.00 and 300 respectively while the fall in price to ~~₦~~40.00 per loaf increases the demand to 500 loaves. The elasticity of demand becomes:

$$\begin{aligned}\eta &= (-1) = \frac{\Delta q}{q} \frac{P}{\Delta P} \\ \eta &= (-1) \frac{500 - 300 / 300}{40 - 60 / 60} = (-1) \frac{200 / 300}{-20 / 60} \\ &= \frac{(-1) 200 \times 60}{300 \times -20} \\ &= \frac{6}{3} \\ &= 2 \text{ (elastic).}\end{aligned}$$

The point we are trying to make in this example is that elasticity value depends on the direction of movement of price. To avoid getting double value for our elasticity we can take percentage change in price to be the change in price divided by the average price. And the percentage change in quantity to be the change in quantity divided by the average of the original and new quantities. Hence our new elasticity formula becomes:

$$\begin{aligned}\eta &= \frac{\frac{(-1)\Delta q}{\frac{q_1 + q_2}{2}}}{\frac{\Delta P}{\frac{P_1 + P_2}{2}}} \\ \eta &= \frac{(-1)\Delta q}{\frac{q_1 + q_2}{2}} \times \frac{\frac{P_1 + P_2}{2}}{\Delta P} \\ \eta &= \frac{(-1)200}{\frac{300 + 500}{2}} \times \frac{\frac{40 + 60}{2}}{-20} \\ &= \frac{-200}{\frac{800}{2}} \times \frac{100}{-20} \\ &= \frac{-200 \times 1 \times 100 \times 1}{800 \times 2 \times 2 \times -20} \\ &= \frac{-5}{2} = 2.5 \text{ (elastic)}\end{aligned}$$

Hence, by taking the average of the original and the new prices or quantities we can get a single value for our elasticity irrespective of direction of movement of the change.

Demand Elasticity and Total Expenditure

Money spent by the purchasers of a commodity is received by the sellers of the commodity. The total amount spent by purchasers is thus the gross revenue of the sellers. Often in economics, we are interested in knowing how total expenditure by purchasers of a commodity or total gross receipts of sellers of the commodity reacts when the price is changed.

If the price of a product falls, there will be an increase in quantity sold; what happens to total revenue depends on the amount by which sales rise in response to a given price cut. Usually this depends on the elasticity of demand for the commodity. If elasticity of demand exceeds unity (demand elastic), a fall in price increases total consumer expenditure and a rise in price reduces it.

If elasticity is less than unity (demand inelastic) as fall in price reduces total expenditure and a rise in price increases it.

On the other hand, if elasticity of demand is unity, a rise or fall in price leaves total expenditure unaffected.

The simple case of our bread producer can illustrate our discussion above. While the price of bread was N60.00 per loaf, the producer was able to sell 300 loaves, making total revenue of N18, 000.00. However, by reducing his price to N40.00, he is now able to sell 500 loaves, making total revenue of N20, 000.00. Thus, for the seller of a commodity that has elastic demand, it is advisable to reduce price in order to increase revenue.

Determination of Elasticity of Demand

1. **Availability and cost of close substitutes:** If a commodity has a close substitute whose price does not change, a rise in price of the commodity will divert consumer's expenditure from the commodity to the substitutes. Hence, its demand becomes relatively price elastic. Examples are butter and margarine, Toyota cars and Datsun cars, etc.

However, when there is no close substitute for a given commodity, e.g. salt, housing, etc., a change in their prices will bring little change in quantity demanded. Hence, they have inelastic demand.

2. **Necessities and Luxuries:** Commodities can be classified into two; necessities and luxuries. Necessities have highly inelastic demand. This is because they are necessary to life and when their prices rises consumers have no choice but to cut back expenditures on other products and go on buying the necessities e.g. salt, pepper, housing, etc.

On the other hand, luxurious goods are dispensable and hence when their prices rise, people will in fact dispense with them; thus they have a highly elastic demand e.g. cars, shoes, etc.

3. **Durability/Time:** In the area of time, what is relatively inelastic in the short run will be relatively elastic in the long run. The reason is that there will be an adjustment. Secondly, in the long run, substitutes could be developed. Also, while durable goods

are price elastic, non-durable goods in most cases are price inelastic.

4. **Habit:** Goods such as cigarettes to which some people are strongly addicted usually have inelastic demand. Changes in price might not bring about a change in demand.

ITQ

Question

- Highlight the various types of price elasticity of demand

Feedback

- These are:
elastic demand; inelastic demand; unitary elastic demand;
perfectly elastic demand; perfectly inelastic demand.

Note

Beside the commodity's own price, it is important to know how changes in the prices of other commodities and income can affect Quantity demanded

3.1.2 Cross Price Elasticity of Demand

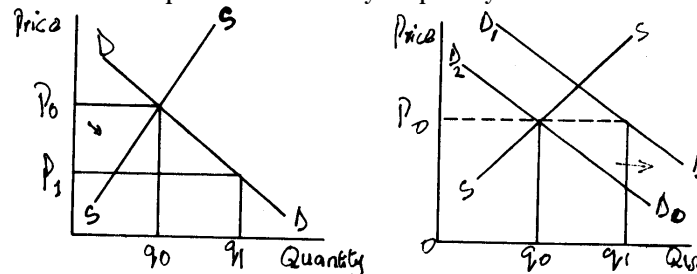
This measure the responsiveness of quantity demanded of one commodity to changes in the prices of other related commodities. It can be defined in equation form as:

$$\eta = (-1) \frac{\text{Percentage change in quantity demanded of Commodity x}}{\text{Percentage change in price of Commodity Y}}$$

Cross price elasticity can vary from minus infinity to plus infinity. Complementary goods have negative cross elasticities and substitute goods have positive cross elasticities. Bread and butter, for example, are complements: a fall in the price of bread causes an increase in the consumption of both commodities. Changes in the price of bread and the quantity of butter demanded as a result will therefore have opposite signs.

Fig 3.6

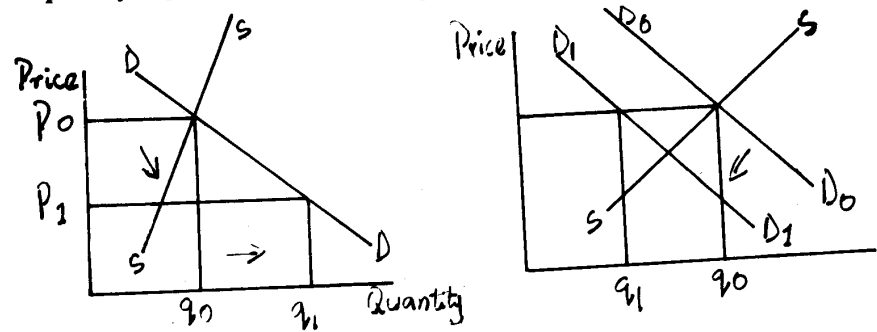
Effect of a fall in price of a commodity on quantity demanded of its complement



Butter and margarine on the other hand are substitutes. A fall in the price of butter increases the quantity of butter demanded but reduces the quantity of margarine demanded. Changes in the price of butter and in the quantity of margarine will therefore have the same sign.

Fig 3.7

Effect of a fall in price of a commodity on quantity demanded of its substitute



However, in a situation where there is no relation between two commodities, we may expect their cross-elasticities to be close to zero.

ITQ

Question

- What is cross-price elasticity of demand?

Feedback

- It measures the responsiveness of quantity demanded of one commodity to changes in the prices of other related commodities.

3.1.3 Income Elasticity of Demand

Income elasticity measures the response of quantity demanded to changes in income. Mathematically, this can be expressed as

$$\eta = (-1) \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

For most commodities, increases in income leads to increase in demand, and income elasticity is therefore positive. Goods with positive income elasticities are called normal goods. Goods with negative income elasticities are called inferior goods; for them a rise in income is accompanied by a fall in quantity demanded. Normal goods are much more common than inferior goods. The boundary between normal and inferior goods occurs when a rise in income leaves quantity demanded unchanged so that income elasticity is zero.

ITQ

Question

- The nature of good determines its elasticity. True or False.

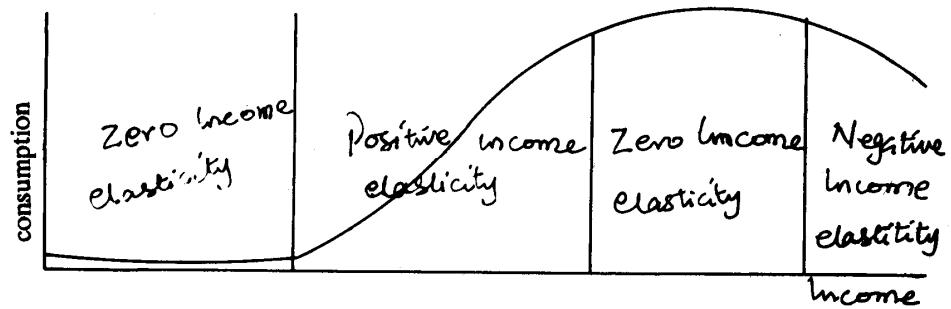
Feedback

- True. Luxury goods can be said to be elastic while necessity goods are said to be inelastic.

The three phases of income elasticity of demand is illustrated in the figure below:

Fig 3.8

A relation between expenditure on a single commodity and household income



Tip

Goods that are complementary have negative cross elasticity while substitutes have positive cross elasticity.

Goods with positive income elasticity are called normal goods while inferior goods have negative income elasticity.

3.2 Elasticity of Supply

Just as elasticity of demand measures the responsiveness of quantity demanded to little changes in price so also the elasticity of supply measures the responsiveness quantity supplied to little changes in the price of the good produced. However, in this paper we shall focus mainly on the commodity's own price. For this reason we shall be concerned mainly with Price elasticity of Supply.

Elasticity of Supply is defined as the percentage change in quantity supplied divided by the percentage change in price that brought it about. Letting the Greek letter epsilon E , stand for this measure its formula is:

$$E = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

Since the supply curves slopes upward from left to right, elasticity of supply, as defined by the above formula will normally be positive. As with demand elasticity, it is best to calculate elasticity of supply by percentage changes on the average of the new and old prices and the new and the old quantities when applying the above formula.

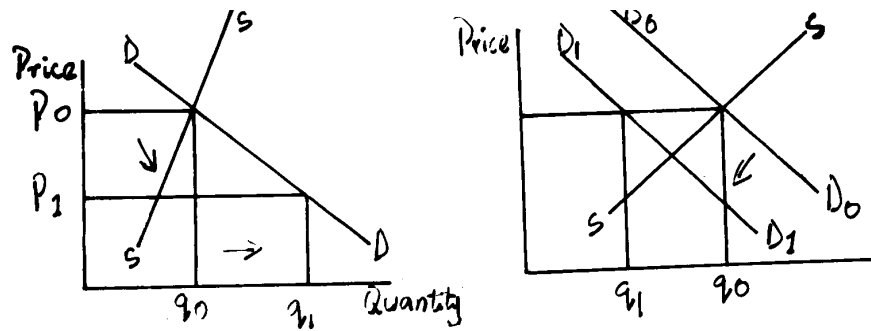
Interpreting Supply Elasticity

The figures below illustrate 3 cases of supply elasticity.

1. The case of zero elasticity is one in which the quantity supplied does not change as price changes. This would be the case, for example, if suppliers persisted in producing a given quantity q_1 in **Fig. (3.9a)** and dumping it on the market for whatever it could bring.

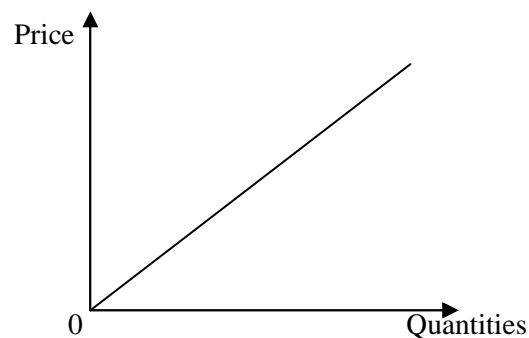
Fig. 3.9a

Fig 3.9b



2. Infinite elasticity is illustrated in **Fig. (3.9b)**. The Supply elasticity is infinite at the price P_1 , because nothing at all is supplied at lower prices, but a small increase in price to P_1 causes supply to rise from zero to an infinitely large amount, indicating that producers would supply any amount demanded at that price.
3. The case of unit elasticity of supply is illustrated in **Fig. (3.10)**. Any straight-line supply curve drawn through the origin has, in fact, an elasticity of unity.

Fig 3.10 Unit Elasticity of Supply



Note



Activity 3.2

Unlike demand, elasticity of supply is always positive because supply and price moves in the same direction. Elasticity of supply is a pure number like demand.

How will you derive the elasticity of supply of biro from the data in Table 3.2?

Table 3.2 Changes in prices and quantities for two commodities

Commodity Quantity	Initial price (₦)	New price (₦)	Initial Quantity	New
Biro	10	20	300	400
Knife	50	80	500	1000

Feedback

$$E_s = \frac{\frac{\text{New supply} - \text{Initial supply}}{\text{Initial supply}}}{\frac{\text{New price} - \text{Initial price}}{\text{Initial price}}}$$

Using our elasticity formular above, we can derive the elasticity of supply

for biro

$$\begin{aligned} & \frac{\Delta q}{\Delta p} \frac{P}{q} \\ &= \frac{400 - 300}{20 - 10} \frac{100}{300} = \frac{100}{10} \frac{1}{3} \\ &= \frac{1}{3} = 0.33 \text{ (inelastic)} \end{aligned}$$

Study Session Summary



Summary

Price elasticity of demand is defined as the responsiveness of demand to a change in price. There are different types of price elasticity of demand. These are elastic demand, inelastic demand unitary elasticity demand, perfectly elastic demand and perfectly inelastic demand. Several factors were identified as the determinant of elasticity of demand. These include the availability and cost of close substitutes, the degree of necessities, the period of time and habit of the consumers.

You were also made aware of other types of elasticity of demands. Firstly cross elasticity of demand which measures the responsiveness of quantity demanded of one commodity to changes in the prices of other related commodities. Secondly, there is also the income elasticity of demand. These measures the responsiveness of quantity demanded to changes in income.

Similar to price elasticity of demand, you are also made to understand, the price elasticity of supply which measures the responsiveness of supply to changes in price.

Assessment



Assessment

SAQ 3.1 (Tests Learning outcome 1)

Calculate the elasticities of demand for the commodities in the table below. Also, state whether the commodity is elastic or inelastic.

Table 3.3 Changes in Prices and Quantities for two Commodities

Commodity	Initial Price (₦)	New Price (₦)	Initial Quantity	New Quantity
Commodity X	₦20.00	₦50.00	400	100
Commodity Y	₦100.00	₦150.00	200	100

SAQ 3.2 (Tests Learning outcome 2)

Derive the elasticity of supply of soap X from the data in Table 3.4.

Table 3.4 Changes in prices and quantities for the commodity

Commodity	Initial price (₦)	New price (₦)	Initial Quantity	New
Soap X	15	20	300	400

SAQ 3.3 (Tests Learning outcome 3)

Highlight the factors which affect elasticity of demand.

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Study Session 4

Consumer Equilibrium

Introduction

This Study Session will introduce you to the theory of consumer equilibrium. You will be exposed to two of the most important theories of consumer behaviour. These are the utility theory and the theory of the indifference curve.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 4.1 *use* utility theory to show how demand curve slopes downward from left to right.
- 4.2 *perform* simple manipulations with indifference curve.

4.1 Utility Theory

Utility can be described as the satisfaction a consumer derives from the consumption of a commodity. It is useful to distinguish between total utility and marginal utility.

Total utility refers to the total satisfaction derived from consuming some commodities. **Marginal utility** on the other hand is the change in satisfaction resulting from consuming a unit more or less of that commodity.

ITQ

Question

- How will you define utility?

Feedback

- It can be defined as the satisfaction a consumer derives from the consumption of a commodity.

4.1.1 Utility Schedule and Graphs

The table below will help you to understand better the utility theory.

Number of plates of rice consumed	Total utility	Marginal utility
0	0	–
1	4	4
2	7	3
3	9	2
4	10	1
5	10	0

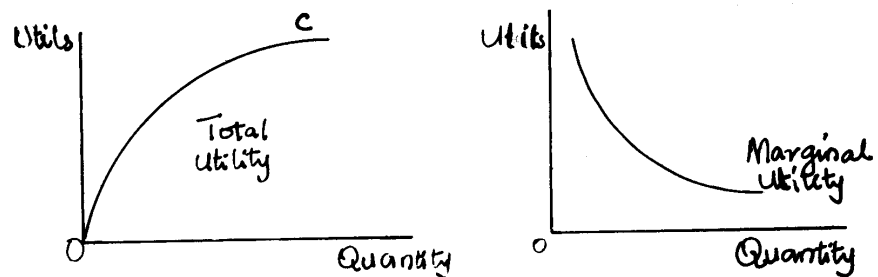
Fig 4.1 Total and marginal schedule

The marginal utility column is derived from the changes in total utility by consuming an additional plate of rice. For instance when you increase the plates of rice you consumed from 2 to 3 plates, your total utility increase from 7 to 9 utils. This increase in your total utility (which is 2) gives the value for marginal utility.

A cursory look at the marginal utility column in Table 4.1 will tell you one important characteristic of marginal utility. This is the successive decline in marginal utility from additional consumption of plates of rice. While you can observe that total utility has been increasing, marginal utility has been decreasing as consumption of rice increases.

A question that may naturally come to your mind is, can marginal utility ever reach zero? The answer is yes, as you can see from Table 4.1. With more commodities consumed, there is a level of marginal consumption after which additional consumption is zero. Commodities include, water, beverages and even reading. Figure below illustrates Total and Marginal Utilities

Fig 4.1 Total and Marginal Utilities



ITQ

Question

- The utility an individual derives from the consumption of an extra commodity is referred to as _____

Feedback

- Marginal utility.

4.1.2 Relationship between Total Utility and Marginal Utility

If total utility is increasing at a decreasing rate as depicted in our example, then the marginal utility declines with increase in consumption. When total utility reaches its maximum point (at point C) then the marginal utility is equal to zero. This is because after the point any additional unit consumed would lead to a fall in total utility.

The declining slope of the Marginal Utility curve reflects the law of diminishing marginal utility which states that the more of a given commodity consumed, the less the addition to total utility.

ITQ

Question

- What do you understand by the concept of diminishing marginal utility?

Feedback

- It states that the more of a given commodity is consumed, the less the addition to total utility.

4.1.3 Maximizing Utility

Certain assumptions are made with respect to the utility theory of consumer behaviour. These assumptions include that commodities are available, prices and incomes are fixed. Perhaps, the most basic assumption is that members of the household seek to maximize their total utility.

The basic problem that faces the household is how to adjust its expenditure and to maximize the total utility of its members. A rational household would go about this by arranging its expenditure among commodities in such a way that the utility gained from the last Naira spent on all commodities are equal. An example will make this point clear. If a consumer is faced with two commodities X and Y with prices P_x and P_y respectively. Furthermore, let MU_x and MU_y be the marginal utilities of the last unit of commodities X and Y respectively.

If marginal utility derived from the last Naira spent on commodity X is greater than that of Y: then the consumer will continue to substitute X for Y; as quantities of X consumed increases, its marginal utility would fall: (law of diminishing marginal utility); while the fall in quantity of Y will raise its marginal utility. This process of substitution of X for Y will continue until the marginal utility per naira spent on X and Y are equal.

Algebraically, this implies that the ratio of MU_x of X to its price is equal to the ratio of marginal utility of Y to its own price. i.e.

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} \dots\dots\dots(1)$$

This is the fundamental equation of the utility theory of demand. Each household demands each commodity up to the point at which the marginal utility per naira spent on it is the same as the marginal utility per naira spent on every other commodity. When this condition is met, the household cannot increase its total utility by shifting a kobo of expenditure from one commodity to another.

For consumer equilibrium, two conditions must be met. The first is the one given by equation (1) above. That is the ratio of marginal utility of one commodity to its price is equal to the ratio of marginal utility of the other commodity to its own price.

The second requirement is that the total expenditure on the commodities be equal to the household's income. That is in our former example

$$XP_x + YP_y = I \dots\dots\dots(2)$$

where XP_x is total expenditure on good X,

$Y P_y$ is total expenditure on Y.

I is total income.

P_x and P_y represents price of X and price of Y respectively.

ITQ

Question

- When does a consumer attain equilibrium in the consumption of a commodity?

Feedback

- Consumer's equilibrium is achieved when the marginal utility derived from the last naira spent equals the price of the commodity.

4.1.4 Paradox of Value

Early economists were unable to explain the paradox of value because they erroneously believed that commodities with high total utilities should be expensive because people valued them highly and vice-versa. They were thus arguing that market values should be related to total utilities. These economists referred to market values as exchange values and to total utilities as use values. They posed their problem by saying what use values should be, but were observed not to be related to exchange values. *However, we know that in real life, market behaviour is not related to total utility but marginal utility.*

Water is cheap because there is so much of it that people consume it to the point at which marginal utility is very low and they are not prepared to pay a high price to obtain a little more of it. Diamonds are very expensive because they are scarce and people have to stop consuming them at the point where marginal utility is still high. Thus, consumers are prepared to pay a high price for an additional diamond consumed.

ITQ

Question

- Which utility concept solves paradox of value?

Feedback

- Marginal utility

4.2 Indifference Theory

The **indifference theory** of household behaviour was developed by Sir John R. Hicks in his book, Value and Capital, published in 1939. The major innovation of this theory was that unlike the utility theory, it did not invoke the notion of a measurable concept of utility.

4.2.1 An Indifference Curve

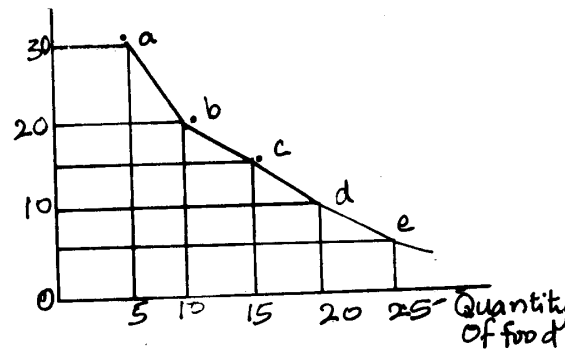
An indifference curve shows all combinations of commodities that yield the same level of satisfaction to the household. A household is indifferent between the combinations indicated by any two points on one indifference curve.

Table 4.2 Alternative bundles of food and clothing giving equal satisfaction to a household

Bundle	Clothing	Food
A	30	5
B	18	10
C	13	15
D	10	20
E	8	25

The table above could be converted into an indifference curve. See the figure below.

Fig 4.2 An indifference curve



The household who owns the indifference curve above is indifferent between points a, b, c, d and e.

Features of an Indifference Curve

1. Its downward sloping indicating that if the household is to have less of one commodity, it must have more of the other to compensate. For instance, in the figure above, for the household to move from point a to b, it must reduce the quantity of clothing consumed from 30 units to 18 units while quantity of food consumed increase from 5 units to 10 units.
2. The Indifference Curve is also convex. Moving down the curve to the right, its slope gets flatter and flatter. The slope of the curve is the marginal rate of substitution, the rate at which one commodity must be substituted for the other in order to keep total utility constant.

ITQ

Question

- What are the features of an indifference curve?

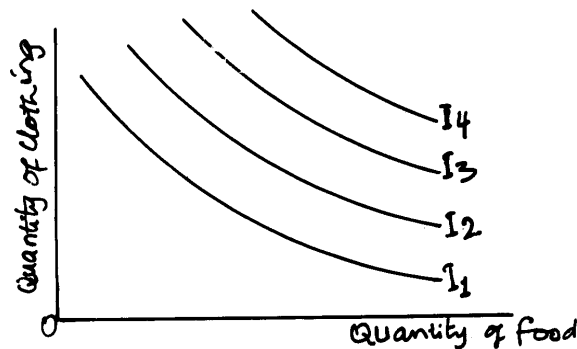
Feedback

- It's downward sloping;
- It's convex to the origin.

4.2.2 An Indifference Map

A set of indifference curves is called an indifference map. The farther from the origin an indifference curve is the higher the level of satisfaction associated with that indifference curve. Thus, any curve above and to the right of an indifference curve will be preferred to the one below it.

Fig 4.3 An indifference map for the household

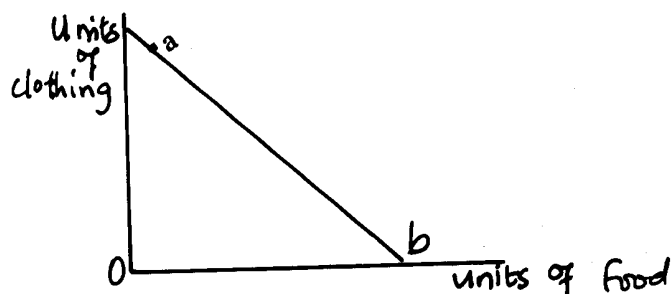


4.2.3 The Budget Line

An important assumption under the theory of demand is that the household spends all of its income on goods and services for current consumption; it neither spends more than its income nor saves any of it.

If for instance, we assume that a household income I is spent on two commodities, clothing and food, then the budget line of such a household will reveal the amount of clothing and food the household could afford given his income I , and the prices of the two commodities.

Fig 4.4 The budget line



ITQ

Question

- What is a budget line?

Feedback

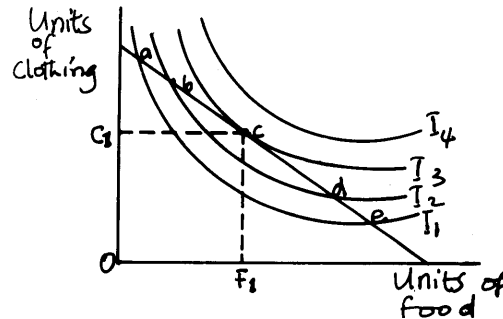
- It's a line that shows the bundle of two goods an household could afford given his income, and the price of the (two) commodities.

4.2.4 The Equilibrium of the Household

Whereas the indifference map describes the wish of the household (i.e.

what he wants), what he could actually demand is dictated by his budget line. Fig 4.5 below brings together the household's taste as shown by its indifference curve and possibilities open to it, as shown by the budget line.

Fig 4.5 The equilibrium of the household



Any point on the budget line is attainable. But the question is which one the household will choose in its objective of maximizing satisfaction.

Suppose that it starts from point a in Fig. 4.4 where it is on indifference curve I_1 . If it moves to point b, it is still on its budget line, but it has moved to a preferred position (since I_2 is greater than I_1). This process continues until it reaches point c, any point beyond point c, say d or e will result in lower indifference curve.

Thus, it could be seen that the household reaches its maximum satisfaction at point c. At this point, the indifference curve is tangential to the budget line. Hence, at point c, the slope of the indifference curve (the marginal rate of substitution of the goods in the household's preferences is equal to the slope of the budget line. The opportunity cost of one good in terms of the other is determined by market prices.

4.2.5 Effects of Changes in income and prices on the Consumer Equilibrium

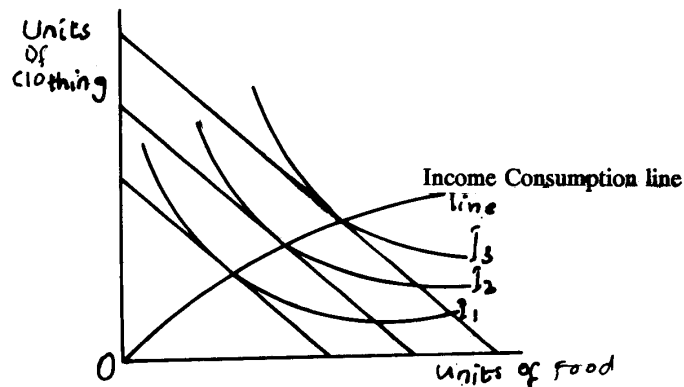
A Change in Income

Changes in income lead to a parallel shift of the budget line - inwards to the origin when income falls, and outwards from the origin when it rises. For each level of income there will be an equilibrium position at which an indifference curve is tangential to the relevant budget line. Each such equilibrium position means that the household is doing as well as it possibly can for that level of income.

In Fig. 4.6 as the household's income is twice increased, the budget line moves outwards from a tangency with indifference curve I_1 to I_2 to I_3 . As we move the budget line through all possible levels of income and join all the points of equilibrium, we will trace what is called an **Income Consumption line**.

This line shows how consumption bundles changes as income changes, with relative prices held constant. In other words, income consumption line shows the reaction of the household to changes in its money income with money prices held constant.

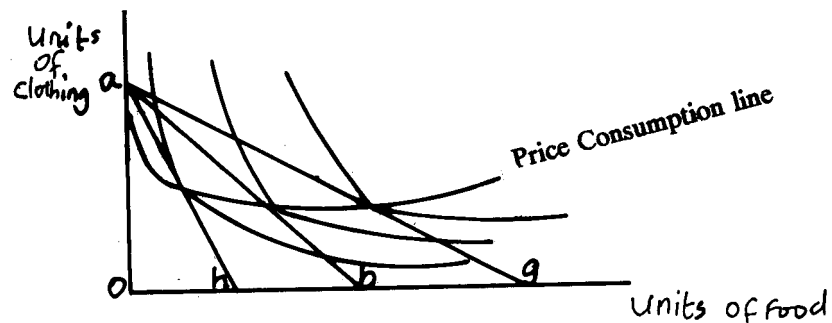
Fig 4.6 The income-consumption line



A Change in Price

A change in the relative price of the two commodities, food and clothing changed the slope of the budget line. For instance, given a budget line ab , a half cut in the price of food, (P_f) while price of clothing (P_c) is kept constant shifts the budget line to ag and if price is doubled the price increase will shift the budget line to ah .

Fig 4.7 The price consumption line



Therefore the locus of tangency between an indifference curve and a budget line as the prices of food changes while price of clothing is held constant, gives, the *Price Consumption line*. This line shows how consumption of the two commodities varies as the price of one changes, the price of the other and the household's money income being kept constant.

Hint

The utility theory is commonly associated with the classical economists while the theory of the indifference curve belongs more to the modern economists.

Study Session Summary



Summary

In the course of this Study Session, you examined some important concepts in consumer equilibrium theory. These include utility and the indifference curve theory. These two different theories are alternative ways of explaining consumer behaviours. While utility curve is based on the assumption of cardinal analysis (i.e. it is measurable), the indifference curve is ordinal (in other words, analysis is not based on measurability of consumer satisfaction).

Assessment



Assessment

SAQ 4.1 (Tests Learning outcome 4.1)

Using utility theory explain how the demand curve slopes downward from left to right.

SAQ 4.2 (Tests Learning outcome 4.2)

What is an indifference curve?

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Study Session 5

The Theory of Supply

Introduction

In the last three Study Sessions, we focused on the behaviour of one of the agents in the economy - the household. In this Study Session, we shall lay the foundation for the study of behaviour of another important economic agent - the firms.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

5.1 *define* and *use* correctly all of the key words printed in **bold**.

- **firms**
- **factors of production**
- **cost**

5.2 *point out* exception to the law of supply.

5.3 *explain* the short run, the long run and the very long run.

5.1 The Theory of Supply

Firm The economic agent which is concerned with the production and sale of commodities. A firm covers all types of business organisations from the sole proprietorship to Joint Stock Company.

The main assumption underlying the study of **firms** in economics is that they seek to maximize their profit in other words; the goal of every firm is to maximize profit. This assumption is useful because it helps us to understand and also predict the behaviour of the firms under different situations.

However, this assumption is not always true in real life because many firms often have more than one objective such as, increasing scale of operation, creating goodwill among its customers, etc. Hence the firm always seeks to pursue its activities in such a way that acceptable balance is forged among these different objectives.

In spite of this obvious limitation, economic analysis of the firm still assumes that the goal of the firm is profit maximization. Profit (Π) is the difference between revenue realized from the sale of commodities (R) and the cost of producing these commodities (C) i. e.

$$\Pi = R - C.$$

In other words, it is possible to break the activities of the firms into two, its revenue and cost of production. It is in respect of these two concepts that much of the theory of supply is based. Cost refers to the monetary value of producing a particular commodity.

However, this is the accountant's definition of cost. To an economist, "**cost** of using something in a particular venture is the benefit foregone by not using it in its best alternative use". However, computational problems arise from this definition. While some costs are easily identifiable and can be estimated, deriving the opportunity costs of some others may be

subjective.

A cost must also be assigned to **factors of production** that the firm neither purchases nor hires because it already owns them. The cost of using such factors is called **imputed costs**. They are estimated at values reflecting what the firm could earn if it shifted these factors to their next best use.

ITQ

Question

What is the difference between Accountant and economist's definition of cost?

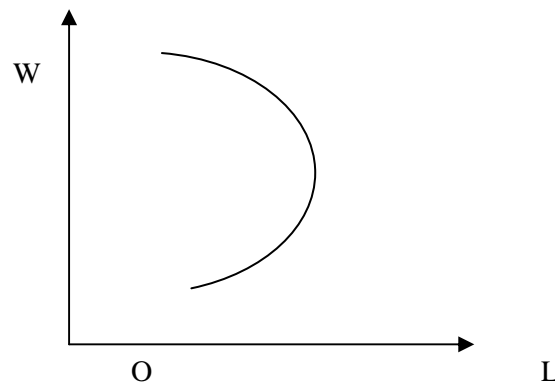
Feedback

To the Accountant, cost refers to the monetary value of producing a particular commodity. While to the Economist, cost of using something in a particular venture is the benefit foregone by not using it in its best alternative use.

5.2 Exceptional Supply

An exception to the law of supply has been found in the backward bending supply curve. This is based on the postulate that although an individual will normally be willing to offer more hours of work L , with increasing wage rate W , a point will be reached where any additional increase in wage rate will lead to a desire for more leisure and therefore a decrease in the number of hours offered for work, thus the supply curve for an individual is shown below.

Fig 5.1 Exceptional Supply Curve



5.3 Short Run, Long Run and the Very Long Run

Short run or long run does not refer to a specific calendar period. It refers to the time period necessary for economic resources to adjust its condition.

- **The short run** is defined as the period of time over which inputs of some factors, called fixed factors, cannot be varied. In the short run, production may be varied by changing the quantities used of those inputs that can be varied; these are called variable factors.
- **The long run** is defined as the period long enough for the inputs of

all factors of production to be varied, but not so long that the basic technology of production changes. The special importance of the long run in production theory is that it corresponds to the situation facing the firm when it is planning to go into business, or to expand or to contract the scale of its operations.

- **The very long run** is concerned with situations in which the technological possibilities open to the firm are subject to change, leading to new and improved products and new methods of production.

Study Session Summary



Summary

In this short Study Session, you learnt how to divide the study of behaviour of the firm into two. The first is its revenue behaviour while the second is the cost behaviour. You also examined the distinction between the two time dimensions which depends on whether some factors are fixed or not. When some inputs or factors of production are fixed, then we talk of short run and vice-versa for long run, i.e. all factors become variable.

Assessment



Assessment

SAQ 5.1 (tests Learning Outcome 5.1)

What do you understand by the terms listed below:

- **firms**
- **factors of production**
- **cost**

SAQ 5.2 (tests Learning Outcome 5.2)

Briefly describe a situation which does not obey the law of supply?

SAQ 5.3 (tests Learning Outcome 5.3)

Explain the short run, the long run and the very long run.

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Study Session 6

The Production Function

Introduction

In the previous Study Session, we mentioned that one of the major functions of the firm is to turn inputs into outputs of commodities. The technological process of performing this important function is called production function. In other words, the production function shows the technological relationship between inputs and outputs. It shows the maximum units of output to be expected from a given input combination. In this Study Session, you will be exposed to the theory of production in economies.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

6.1 *define* and *use* correctly all of the key words printed in **bold**.

- **production functions**
- **production processes**
- **point of diminishing average productivity**
- **diminishing returns**

6.1 The Production Function

The **production function** expresses a technological relationship between inputs and outputs. In mathematical notations, a production function can be written as:

$$q = f(X_i, Y_i) \dots \dots \dots (1)$$

Where

X_i = variable factors

Y_i = fixed inputs

$i = 1 \dots \dots \dots n$.

In most treatment of production function in economics, two major factors of production are usually presumed to be adequate for expressing production relations. These are labour and capital. This will then give a simple production function as:

$$q = f(K, L) \dots \dots \dots (2)$$

Where q is tons of output per given time, say a day, L is total labour hours/days employed while k is employed as units of capital services (e.g. machine days) used.

You would realize that since output depends on inputs, in order to increase total output then the inputs used must also be increased. But the firm cannot vary all its inputs with the same ease. For instance, while it is

easy to increase the number of workers at very short notice, it takes a relatively longer time to install a new production plant.

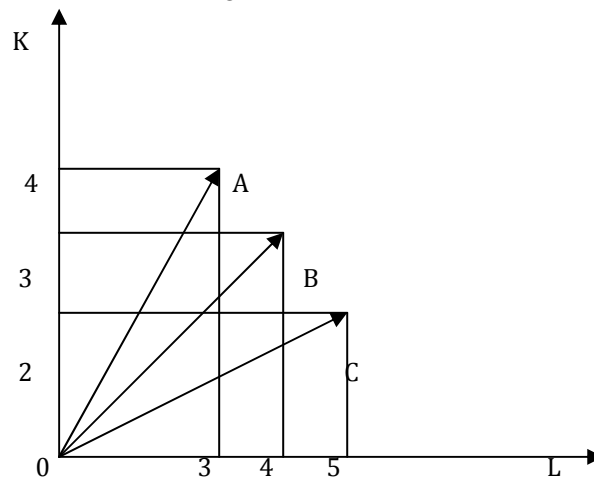
Usually a commodity may be produced by various methods of production. For example a unit of commodity X may be produced by the following **production processes**:

	Process A	Process B	Process C
Labour Units	3	4	5
Capital Units	4	3	2

Activities may be presented graphically by the length of lines from the origin to the point determined by the labour and capital inputs. The three processes above are shown in Fig 6.1.

Fig 6.1
Processes

Production



Method of production A is technically efficient relative to any other method B, if A uses less of at least one factor and no more from the other factors as compared with B. for example, commodity Y can be produced by two methods:

	A	B
Labour	3	4
Capital	4	4

Method B is technically inefficient as compared with A. The basic theory of production concentrates only on efficient methods. Inefficient methods will not be used by rational entrepreneurs. If process A uses less of some factors and more of some others as compared with any other process B, then A and B cannot be directly compared on the criterion of technical efficiency. For example, the activities below are not directly comparable.

	A	B
Labour	3	2
Capital	4	5

Both processes are considered as technically efficient and are included in the production function (the technology). Which one of them will be

chosen any particular time depends on the prices of factors. The theory of production describes the laws of production. The choice of particular techniques (among the set of technically efficient processes) is an economic one, based on prices, and not a technical one

Production Function in the Short Run

In the theory of the firm in Study Session Five, we make a distinction between two periods of analysis - the short run and the long run. In the short run, we assume that only few production factors can be varied while some others are fixed. On the other hand, in the long run, all production factors are variable.

Taking the short run period, we may assume for simplicity sake, that in the production functions, labour is variable and capital is fixed. That is to say, our equation two above can be rewritten as:

$$q = f(L, \bar{K}) \dots \dots (3)$$

Where \bar{K} implies that capital is fixed

Thus in the short run, output can only be increased by increasing the amount of the variable input to a fixed input.

It is useful at this point to define some important concepts.

Total Product (TP): This is the total amount produced during some period of time by all factors of production employed. If the inputs of all but one factor are held constant, total product will change as more or less of the variable input is used.

$$\text{i.e. } q = f(L)$$

Average Product (AP): This is merely the total product per unit of the variable factor, which is labour in the present illustration:

$$AP = TP/L$$

Marginal Product (MP): Sometimes called incremental product is the change in total product resulting from the use of one more (or one less) unit of the variable factor.

$$MP = \Delta TP / \Delta L$$

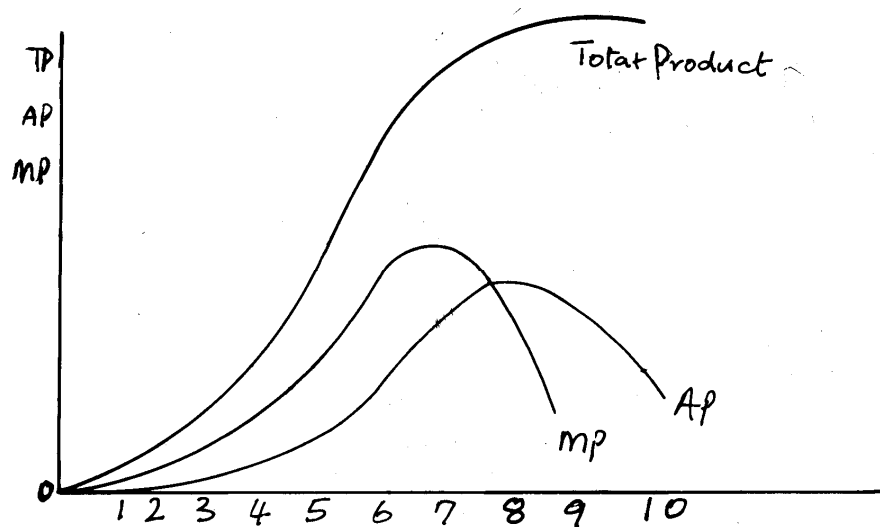
Where, ΔTP stands for the change in the total product and ΔL stands for the change in labour input that caused TP to change.

The table below gives a hypothetical example. Capital is fixed at twenty units

Table 6.1 Variation of output (one fixed, one variable factor)

(1)	(2)	(3)	(4)
Quantity of Labour	Total Product (TP)	Average Product (AP)	Marginal Product (MP)
1	6	6	–
2	14	7	8
3	26	8.7	12
4	37	9.3	11
5	46	9.2	9
6	52	8.7	6
7	57	8.1	5
8	60	7.5	3
9	61	6.8	1
10	58	5.8	-3

Fig 6.2 Relationship among Total Product (TP) Average Product (AP) and Marginal Product (MP)



From both the table and the curve, it is seen that as more of the variable factor is used, average product first rises and then falls. The point where AP reaches a maximum is called the **point of diminishing average productivity**. At this point also, MP and AP are equal. It can also be observed from the curve that MP reaches its maximum at a lower level of labour input than does AP.

The Hypothesis of Diminishing Returns

This is one of the famous hypotheses in economics. It is also sometimes referred to as the law of **diminishing returns**. This law seeks to explain the behaviour of output as a result of applying more or less of variable factor to a fixed factor. The law states that "if increasing quantities of a variable factor are applied to given fixed factors, the marginal product

and the average product of the variable factor will eventually decrease".

There are many practical demonstrations of this law in real life. It is the reason for the present fear about food crisis in most countries today. In countries with a high population growth rate, it is feared that the increased number of workers on the fixed land will bring about an inexorable decline in the marginal productivity of each worker and thus a shortage of food output. The only way out of this trap of diminishing food returns is by improving on the technique of production.

ITQ

Question

1. What is a production function?
2. State the hypothesis of diminishing returns.

Feedback

1. The production function expresses a technological relationship between inputs and outputs.
2. The law states that "if increasing quantities of a variable factor are applied to given fixed factors, the marginal product and the average product of the variable factor will eventually decrease".

Study Session Summary



Summary

In this Study Session, you learnt that production function only expresses relationship between quantities of input and output. In production function, the short run features fixed and variable inputs, while in the long run, all factors of production are variable. You also examined the law of diminishing returns which states that the increasing application of variable inputs to a fixed factor of production will after a time lead to diminishing marginal output.

Assessment



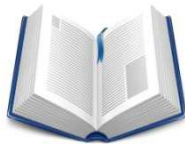
Assessment

SAQ 6.1 (Tests Learning outcome 1)

What do you understand by each of the following terms listed below?

- production functions
- production processes
- point of diminishing average productivity
- diminishing returns

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Study Session 7

Cost Analysis

Introduction

In one of our previous sessions (Study Session five), we defined cost in economics as an opportunity cost of a given action. In this Study Session, we will explore cost analysis.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

7.1 *explain* the theory of the firm.

7.2 *analyse* the important cost concepts commonly applied in economics analysis.

7.1 Forms of Cost

Notably cost could be either explicit or implicit. **Explicit costs** are those direct payments which a firm makes on factors of production for their contribution towards the production process. **Implicit cost** on the other hand refers to the cost for a firm using its own resources considering the fact that such resource, if put into alternative uses could be expected to yield some returns.

7.2 Short Run Cost Functions

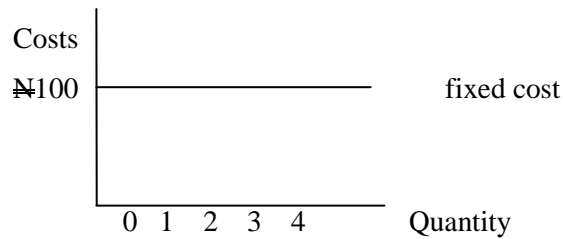
A firm's cost will vary, depending on whether they are based on the short or long run. In the short run, the firm cannot vary the size of plant and equipments it uses. These are the firm's fixed inputs, and they determine the scale of its operations.

7.2.1 Total Costs in the Short Run

Total Fixed Costs

This is the total expenditure spent by the firm on its fixed inputs over a period of time. Since the inputs are fixed, the total fixed cost will be the same whatever the firm's level of output. Examples of fixed cost include: manager's salaries, rent, interest on bonds issued in the past, depreciation of machinery etc. The figure below shows an example of fixed cost. The total fixed cost function is always a horizontal line, since fixed costs do not vary with output, as shown below.

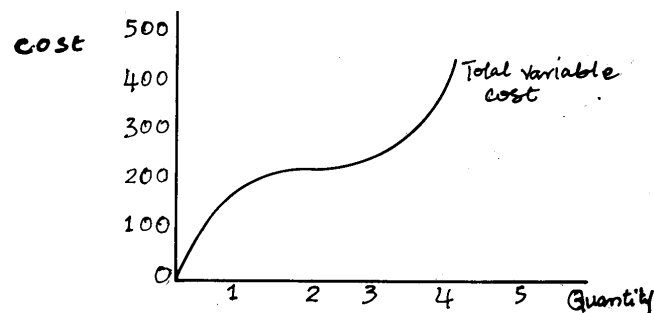
Fig 7.1 Fixed Cost



Total Variable Cost

This represents the firm's total expenditure on variable inputs per period of time. Since higher output rate requires greater utilization of variable inputs, this implies higher total variable cost. For instance, a firm that wants to increase output will need to employ more labour, purchase more raw materials, etc. All these will add to total cost of the firm. Example of total variable cost is illustrated by the Fig 7.2.

Fig 7.2

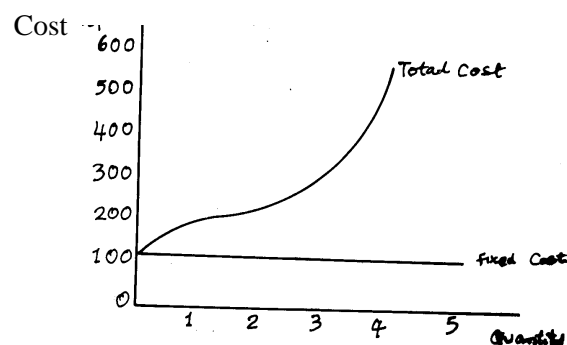


The shape of the total variable cost looks like that of an inverted 'S'. This is due to the law of diminishing marginal returns, total variable cost increases first at a decreasing rate, then at an increasing rate.

Total Cost

This is the sum of total fixed cost and total variable cost. This is illustrated below.

Fig 7.3 Total cost



The total cost curve has the same shape as the total variable cost curve, since they differ by only a constant amount (equal to total fixed cost).

7.3 Average Costs in the Short Run

An entrepreneur cares about his average cost as well as the total cost incurred in his operations, so do economists. Average cost tells how much a

product costs per unit of output. There are three types of average cost functions, one corresponding to each of the three total cost functions.

7.3.1 Average Fixed Cost

This is simply total fixed cost divided by the firm's output. Average fixed cost (AFC) must decline with increases in output, since it equals a constant total fixed cost divided by the output rate.

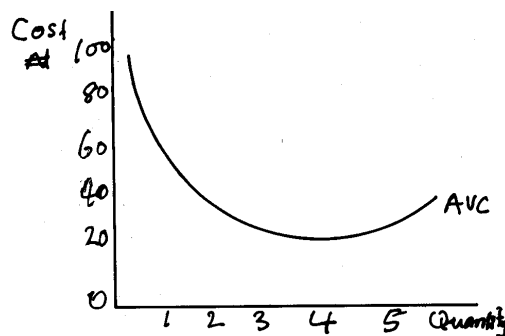
Fig 7.4 Average fixed cost curve



7.3.2 Average Variable Cost

This is total variable cost divided by output, the average variable cost (AVC) is shown below:

Fig 7.5 Average variable cost curve



From the figure above we can see that at first, increase in the output rate results in decreases in average variable cost, but beyond a point, they result in higher average variable cost. This is because the law of diminishing marginal returns is in operation. As more and more of the variable inputs are utilized, the extra output they produce decline beyond some point, so that the amount spent on variable inputs per unit of output tends to increase.

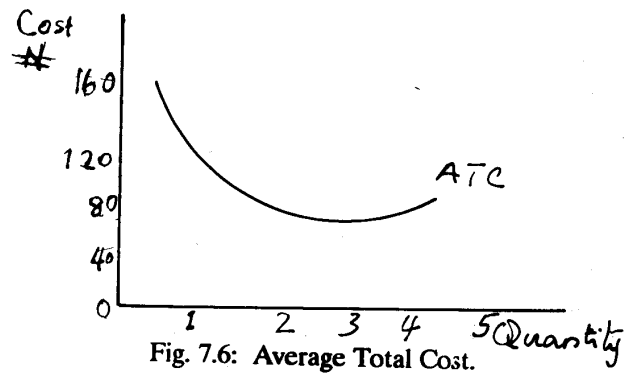
7.3.3 Average Total Cost (ATC)

This is simply the total cost divided by output. At any level of output, average total cost equals average fixed cost plus average variable cost. This is easy to prove.

$$\frac{\text{Total cost}}{\text{Output}} = \frac{\text{Total fixed cost} + \text{Total variable cost}}{\text{Output}}$$

$$\text{ATC} = \frac{\text{Total fixed cost}}{\text{Output}} = \frac{\text{Total variable cost}}{\text{Output}}$$

$$= \text{Average Fixed Cost} + \text{Average Variable Cost}$$

Fig 7.6 Average total cost

7.4 Marginal Cost in the Short Run

Marginal cost is the addition to total cost resulting from the addition of the last unit of output. Algebraically, this can be expressed as

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{TC_{n+1} - TC_n}{Q_{n+1} - Q_n}$$

where MC = Marginal cost, D represents change, TC is total cost and Q is output. The subscript n, n + 1 are present and next period changes in the cost and output variables.

In general, marginal cost will vary depending on the firm's output level. Fig 7.7 shows the marginal cost function graphically.

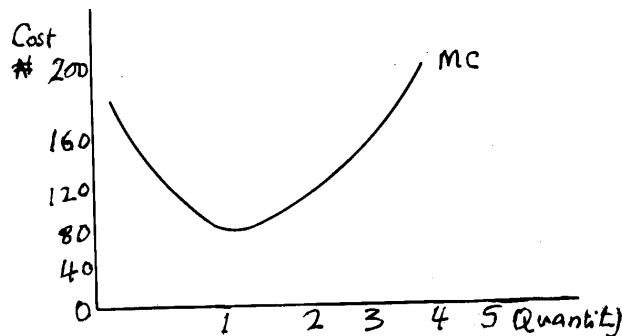
Fig 7.7 Marginal cost

Fig 7.7 indicates that marginal cost, after decreasing with increases in output at low output levels, increases with further increases in output. In other words, beyond some point it becomes more and more costly for the firm to produce yet another unit of output.

Relationship between Marginal Cost and Average Cost Functions

The relationship between the marginal cost function and average cost functions must be noted. Fig 7.8 shows the marginal cost curve together with the three average cost curves.

Fig 7.8 MC, ATC, AVC and AFC Curves

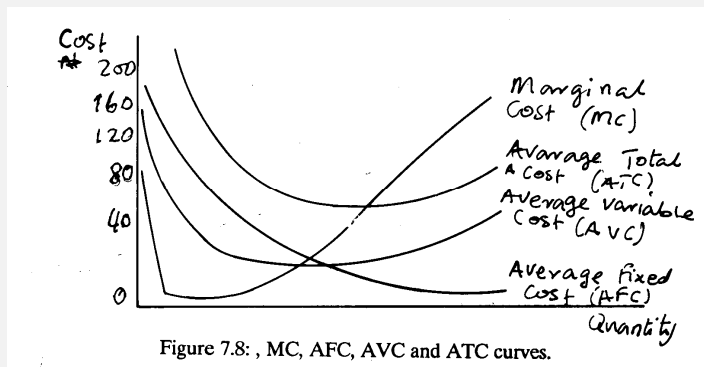
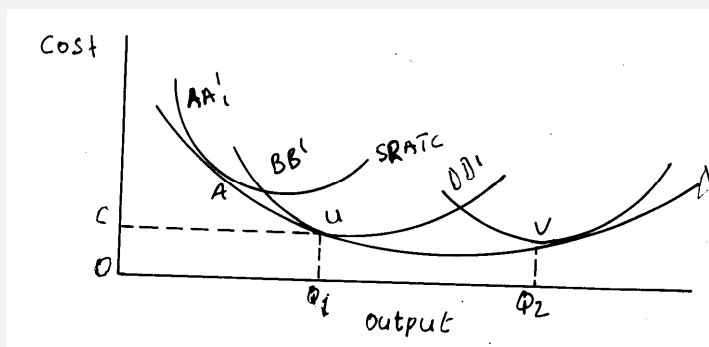


Fig 7.9

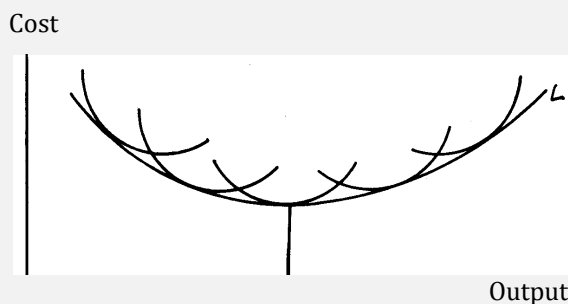
The traditional theory of cost postulates that in the short run the cost curves (AVC, ATC and MC) are U shaped reflecting the law of Variable proportion. The minimum point of the ATC occurs to the right of the minimum point of the AVC. This is due to the fact that ATC includes AFC, and the latter falls continuously with increases in output. After the AVC has reached its lowest point and starts rising, its rise is over a certain range offset by the fall in the AFC, so that the ATC continues to fall despite the increase in AVC. However the rise in AVC eventually becomes greater than the fall in the AFC so that the ATC starts increasing. The AVC approaches the ATC asymptotically as output increases.

The **long run average cost curve** is derived from short run cost curves. Each point on the LAC curve correspond to a point on a short run cost curve, which is tangent to the LAC at that point (see fig 7.9)



Let us examine the U shape of the LAC. This shape reflects the laws of return to scale. According to these laws, the unit costs of production decreases as plant size increases, due to the economies of scale which the larger plant sizes make possible.

Fig 7.10 Long run average cost curve



In the long run, the firm will be optimal when it operates at the minimum point on its long run average cost curve.



Tip

The marginal cost curve intersects both the average variable cost curve and the average total cost at their minimum point. When the marginal cost is greater than average cost the average cost must be rising and vice-versa. This therefore implies that the average cost can be only at a minimum when it equals the marginal cost.

Study Session Summary



Summary

The cost function is the mirror-image of the production function. The short run cost curve, total fixed costs, total costs, total variable costs are all the opposite of their corresponding production functions. You were also shown the relationship between the marginal cost function and the average cost function.

The long run cost functions also plays important role in the decision making of the firm, especially during the planning period.

Assessment



Assessment

SAQ 7.1 (tests Learning Outcome 7.1)

The theory of the firm consists of a number of economic theories that describe, explain, and predict the nature of the firm, company, or corporation, including its existence, , structure, and relationship to the market. Explain the main focus and behaviour of theory of the firm.

SAQ 7.2 (tests Learning Outcome 7.2)

A firm has not being producing for the past three months but it continued to pay a rent of N10,000 every month and pays N200,000 as salaries to worker. (a) What type of cost do you say the firm has incurred? (b) Calculate the total of this type of cost incurred by the company.

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Study Session 8

The Equilibrium of a Profit Maximizing Firm

Introduction

You will recollect that we said in Study Session Five that the objective of the firm is profit maximization. In the present Study Session, we shall develop the rules for profit maximizing behaviour which applies to all firms.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

8.1 *define* and *use* correctly all of the key words printed in **bold**.

- **Revenue**
- **Total revenue**
- **Average revenue**
- **Marginal revenue**

8.2 *highlight* behavioural rules for profit maximization.

8.1 The Concept of Revenue

Revenue refers to the total amount of money which a firm realises from the sales of its products. Revenue can be sub-divided into three. That is:

1. **Total Revenue (TR)**: This is also called revenue. It is the total amount that a firm receives from the sales of its products. In normal cases, this revenue will vary directly with the firm's sales. That is to say, the higher the quantity of the products sold, the higher the total revenue of the firm. Total Revenue is equal to the quantity sold multiplied by the selling price of the commodity, i.e.

$$TR = Pq.$$

Where P is the price per unit, q is the quantity

2. **Average Revenue (AR)**: This is the total revenue divided by the quantity of the products sold, i.e.

$$AR = TR/Q.$$

You will notice that this is also equal to the price of the commodity.

3. **Marginal Revenue (MR)**: This is the change in total revenue resulting from increases in total sales by one unit per period of time, i.e.

$$MR_n = TR_{n+1} - TR_n$$

Where n refers to the number of units sold.

ITQ

Question

What is revenue? State the sub-division of revenue known to you.

Feedback

Revenue refers to the total amount of money which a firm realises from the sales of its products. It can be sub-divided into:

- a) Total revenue;
- b) Average revenue;
- c) marginal revenue.

8.2 Behavioural Rules for profit Maximization

There are essentially three rules here.

1. A rule to decide whether to produce or not to produce

A firm has the option of either producing or not to produce at all. If it produces nothing it will have an operating loss equal to its fixed cost. The firm will however choose the option of producing provided the output produced will add more to total revenue than to costs. Thus, the first rule is that a firm should produce only if total revenue is equal to or greater than total variable cost". Put differently, a firm should produce only if average revenue (i.e. price) is equal to or greater than average variable cost.

2. A rule to ensure that profit is either at a maximum or at a minimum

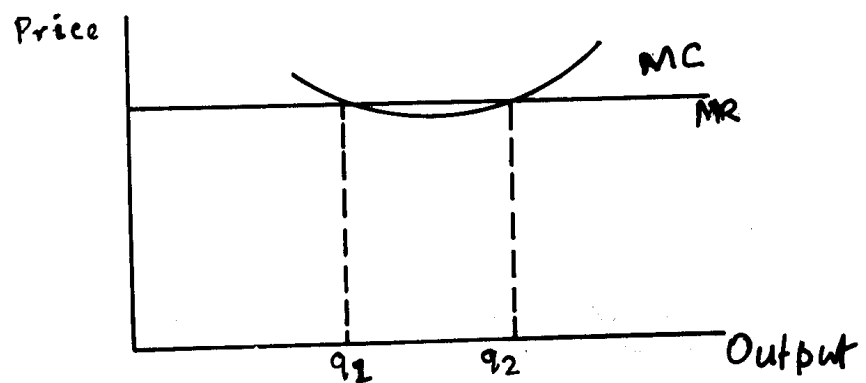
A firm needs to decide on how much of a good it should produce. Generally, it pays a firm to increase its output when marginal revenue of the last unit she produces is greater than its corresponding marginal cost. If on the other hand, the firm finds that the marginal cost of an additional unit of output exceeds the marginal revenue that firm should reduce output.

Thus the second rule states that if a firm is to be in a position where it does not pay its output i.e. in a profit maximizing position - it is necessary that marginal cost be equal to marginal revenue.

3. A rule to ensure that profit is maximized rather than minimized

The fulfilment of the second rule however does not guarantee that profit if it exists is at a maximum. The figure below will help you in understanding our point here.

Fig 8.1 The Minimum and Maximum Profit Positions



Hint

In the long run, the firm will be optimal when it operates at the minimum point on its long run average cost curve.

In Fig. 8.1, There are 2 output levels q_1 and q_2 that satisfy rule two (that $MR = MC$). Output q_1 however is a minimum profit position because a change in output in either direction would increase profit.

On the other hand output q_2 is a maximum profit position since at output, above it MC exceeds MR and profit can be increased by reducing output towards q_2 .

Thus the condition for profit maximizing output is that the mc curve should intersect the MR curve from below. This ensures that $MC < MR$ to the left of q_2 and $MC > MR$ to the right of the profit maximizing output.

All the above three rules determine the output that will be chosen by any firm that maximizes its profits.

ITQ

Question

Highlight three rules for profit maximization

Feedback

- A rule to decide whether to produce or not to produce.
- A rule to ensure that profit is either at a maximum or at a minimum.
- A rule to ensure that profit is maximized rather than minimized.

Study Session Summary



Summary

Profit which is the difference between revenue and cost is the most important driving force for a profit maximizing firm. In this Study Session you have been told the principal rules that determine whether a firm is maximizing profit or not. These three rules can be stated briefly as follows:

1. Total revenue should be equal to or greater than total cost.
2. At the maximum output level, marginal revenue should be equal to marginal cost.
3. The MC curve should intersect the MR curve from below.

Assessment



Assessment

SAQ 8.1 (tests Learning Outcome 8.1)

If a firm realises N200 as its all the revenue realised from the sale of 100 quantity of its product, calculate the firm's average cost. If the firm realises N220 from the sale of 110 of its product, what will be its marginal revenue?

SAQ 8.2((tests Learning Outcome 8.2)

List the three rules for profit maximization.

Study Session 9

The Theory of Perfect Competition

Introduction



Learning Outcomes

A useful method of market classification is the degree of competition available. Hence, a distinction is usually made between perfect and imperfect competition. You will examine the theory of perfect competition in this Study Session.

When you have studied this session, you should be able to:

- 9.1 *highlight* the characteristics and behaviours of the perfect competitive market.
- 9.2 *discuss* the relationship between the firms, market supply and the marginal cost curve.
- 9.3 *point out* the conditions for short run and long run equilibrium of the market.

9.1 Assumptions of Theory of Perfect Competition

The theory of **perfect competition** is built on a number of assumptions. These are:

1. The firm is assumed to be a **price taker**. This means that no individual is so big as to influence the market price. Hence, the firm must accept as given whatever price is ruling in the market.
2. The industry is also characterised by freedom of **entry and exit**. This implies that any firm is free to join or leave the industry. Existing firms cannot bar the entry of new firms and there are no legal restriction on entry' or exit.
3. The industry or market includes a *large number of firms (and buyers)*, so that each individual firm, however large, supplies only a small part of the total quantity offered in the market. The buyers are also numerous so that no monopolistic power can affect the working of the market.

Other important assumptions includes: perfect information about market prices, perfect mobility of products dealt with, While it is perfectly true that a market structure in which all these situations are present is rare in the real world, we have some approximations, e.g. agricultural goods and industrial raw materials. In spite of this, there is no doubt that perfect competition is an ideal situation.

9.2 Demand and Revenue Curve of the Perfectly Competitive Firm

A firm in a perfect competition is a price taker, therefore it faces a perfectly elastic demand curve for its products. Also, since the market price is unaffected by changes in its output, it follows that the marginal revenue resulting from an increase in volume of sales is constant and

equal to the price of the product. An example will make this point clearer. Let's assume that a farmer faces a perfectly elastic demand for yam at a market price of N100.00 per tuber. This implies that for each additional tuber sold, the farmer would realise N100.00 (this is his marginal revenue). But this amount is also his average revenue (which is total revenue divided by number of units sold). Thus, the demand curve facing the firm is then identical with both the average marginal revenue curve. Thus, $P = AR = MR$: all remaining constant as output varies. It is however, important to mention that since price is constant, each additional unit sold will increase total revenue of the farmer. It therefore follows that total revenue rises steadily as output rises.

Fig 9.1

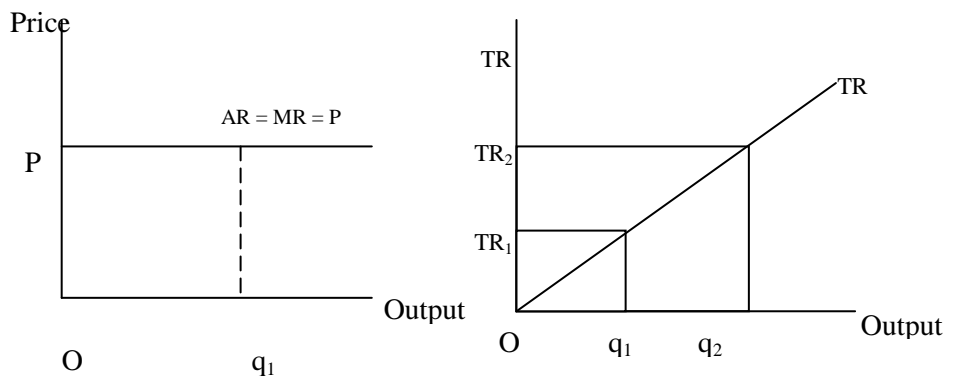


Fig 9.1a Average and marginal revenue

Fig 9.1b Total Revenue

Short Run Equilibrium

Since the firm in perfect competition faces a given market price the firm adjusts to different market situations by changing its output. But, in the short run the firm is faced with a set of fixed and variable factors. Hence, its practical method of adjustment is via the variation of its output decision.

ITQ

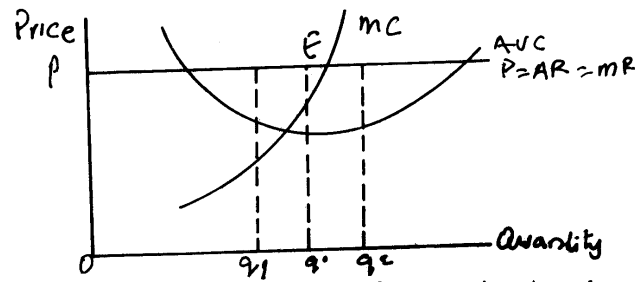
Question

Highlight the characteristics and behaviours of a perfectly competitive market

Feedback

- The firm is assumed to be a price taker.
- There is free entry and free exit.
- Large number of buyers and sellers/firms.
- Perfect information about market prices.

Fig 9.2 The equilibrium output of the perfect competitor



Perfect competitive firm like any profit maximizing firm will seek to produce at the point where marginal revenue is also equal to the marginal cost. And since, marginal revenue of a firm is also equal to its price; it follows that the firm will equate marginal cost of its product with the price of its output. Hence, the short run equilibrium position of the firm can be represented as follows.

Any other output is inefficient. For instance at output q_2 , $MC > P$, thus it will pay the firm to reduce its output. Conversely, at output q_1 , $price > MC$ and it pays the firm to increase its output level.

It should be reiterated that in the short run, the firm can make profit or losses or break-even. The actual position of the firm depends on the position of the average cost. If at the equilibrium output level of the firm, price is greater than its average cost then it will make profit. On the other hand, it could make a loss if it is not covering average cost. Even when the firm is making a loss at this point, it could still continue in business provided it is able to cover at least its average variable cost (AVC).

ITQ

Question

What characterises the output decisions of a firm in a perfectly competitive market?

Feedback

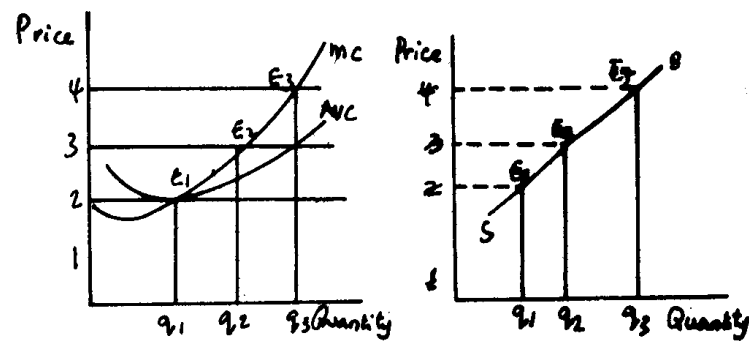
It's determined at the equality of marginal cost with marginal revenue.

9.3 Short Run Supply Curves

The supply curve shows the relation between quantity supplied and price. As we said earlier the competitive firm is a price taker. Therefore in order to derive its supply curves we need to know how much the firm will supply at each different prices.

The figure below shows a firm's marginal cost curve with three alternative demand curves. The marginal cost curves show the quantity the firm is willing to supply at each price level. For prices below AVC, the firm will supply zero. For prices above AVC, the firm will equate price and marginal cost

Fig 9.3



a. MC and AVC curves

b. The supply curve

As price rises in the figure from 2 to 3 to 4, the firm wishes to increase its production from q_1 to q_2 to q_3 . For prices below 2, output would be zero because the firm is better off if it shut down. The point E_1 where price equals AVC is called the shut-down point. These points are then transferred to curve ii to show the supply curve.

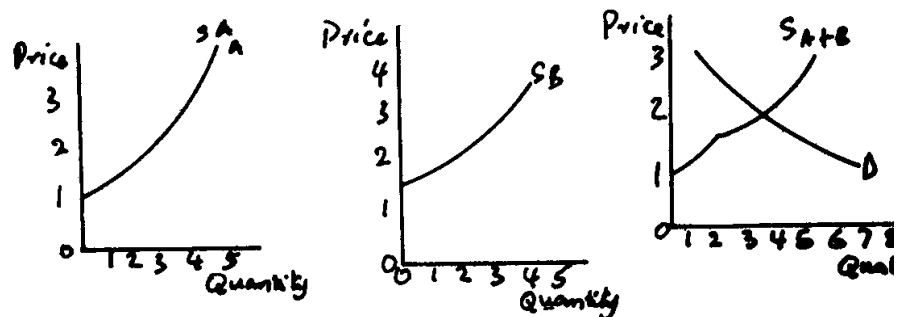
In perfect competition therefore the part of the firm's MC curve above the AVC curve has the same shape as the firm's supply curve.

The Determination of Short Run Equilibrium Price

The equilibrium price in the industry is determined by the forces of demand and supply in the industry.

The industry's supply curve is simply the horizontal sum of the marginal cost curves of all the individual firms in the industry. Let's assume there are two firms A and B in the industry. If their individual supply curves are as shown below, then the industry supply curve is simply the horizontal summation of the two supply curves.

Fig 9.4



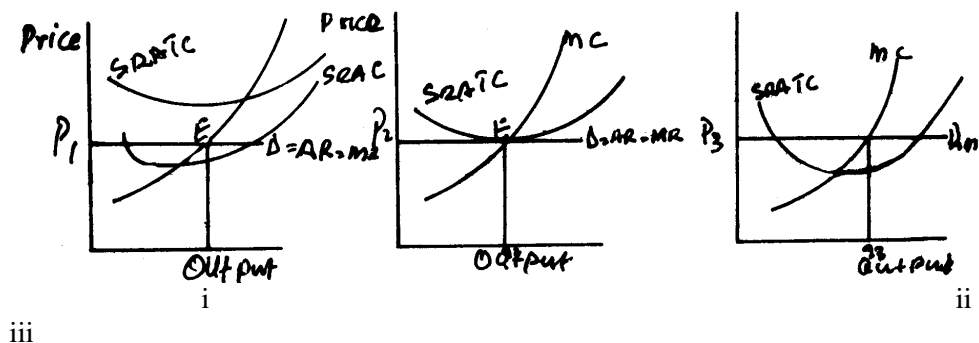
Although, no one firm can influence market price significantly, the collective actions of all firms in the industry (as shown by the industry supply curve) and the collective actions of the households (as shown by the industry's demand curve) together determine the market price at the point where demand and supply curves intersect. See Fig. 9.4 (iii) above.

At this equilibrium point, there is stability in the market and there is no motivation to change in the short run. Also each firm is operating at the profit maximizing point at which its price is equal to its marginal cost.

Long Run Equilibrium

The long run equilibrium under perfect competition is characterized by free entry and exit. Earlier, we have said that in the short run equilibrium situation, firms may be making profits or losses or just breaking even. If existing firms are making profits, new firms may be attracted to the industry to share in the profit. On the other hand, if existing firms are making losses, some firms will leave the industry and seek better returns elsewhere. However, when firms are just breaking even, there is no incentive for other firms to enter the industry or for firms in the industry to leave. These three situations can be further illustrated as follows:

Fig 9.5 Alternative Short Run Equilibrium Position of a Competitive Firm



In Fig.9.5(i), firms in the industry are making losses since price is lower than SRATC. This will force some firms to leave the industry for elsewhere. When this happens, supply will decrease and price will increase. This will continue until Fig. 9.5 (ii) position is attained. The converse argument holds for Fig. 9.5 (iii).



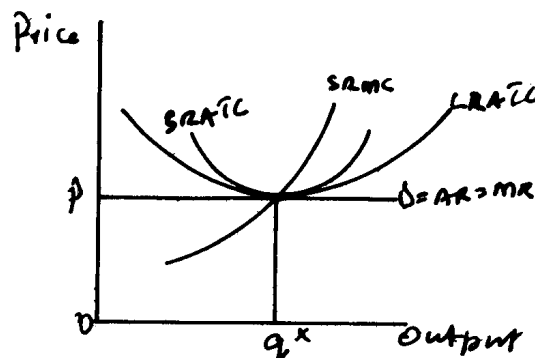
Tip

In the Long run equilibrium situation three distinct features are obtained.

1. No firm will want to vary the output of its existing plants. Short run marginal cost (SRMC) must equal price.
2. Profits earned by existing plants must be zero. This implies that short run ATC must equal price.
3. No firm can earn profits by building a plant of a different size. This implies that each existing firm must be producing at the lowest point on its long run average cost curve.

These conditions mean that all firms in the industry should be in the position illustrated in Fig. 9.6.

Fig 9.6 The equilibrium position of a firm when the industry is in the long run equilibrium



In the above situation, the firm is operating the optimum plant size (as represented by the minimum point on its LRATC). Any plant size to the left or right of q^x would be sub-optimal and it will pay well to advise the firm to increase or decrease output as the case may be as regards its existing plant size.



Tip

Like any other profit making organisation, the perfect competitive producer output equilibrium is at a level where its price is equal to marginal cost. Although the firm in perfect competition can make profit or loss in the short-run, in the long run the firm can only break into the industry if it is making excess profit other firms will be attracted into the industry and if it is a loss, it will quit the market.

An industry is nothing more than a collection of firms; for an industry to be in long run equilibrium each firm must be in their long run equilibrium. It follows that when a perfectly competitive industry is in long run equilibrium, all firms in the industry will be selling at a price equal to SRATC that is, and they must be in zero profit equilibrium.

ITQ

Question

What are the conditions for short run and long run equilibrium in a perfectly competitive market?

Feedback

- Short run equilibrium is achieved when $MC=MR$; $AR > AC$
- Long run equilibrium is achieved when $MC=MR=AC=AR=Price$

Hint

The industry supply curve is simply the horizontal summation of the individual firm's marginal cost curves.

Study Session Summary



Summary

In this Study Session, we noted that perfect competitive market is characterised by certain attributes, which include: free entry and exit, perfect information by the sellers and buyers, large number of buyers and sellers, homogeneity of products sold and no discrimination by seller or buyer. A perfect competitive market is however very rare in the real life.

Assessment



Assessment

SAQ 9.1 ((tests Learning Outcome 9.1))

Which of the following goods and services are likely produced in a perfectly competitive industry? Relate your answer to the assumptions of the model of perfect competition.

1. International express mail service
2. Corn
3. Athletic shoes

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Study Session 10

The Theory of Monopoly

Introduction

A monopoly and a perfect competition represent two polar extremes of market situation. Monopoly occurs when there is a single seller in the market. In this case, it is impossible to distinguish between a firm and an industry. Also unlike the firm under perfect competition which cannot influence market price, a monopolist has power to influence the market price. By changing the level of his output, it can influence the ruling price level.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 10.1 *highlight* the main features of monopoly.
- 10.2 *show* the equilibrium position of the monopoly.
- 10.3 *explain* the reasons for the existence of monopoly.
- 10.4 *show* the difference between ordinary monopoly and price discriminatory monopoly.

10.1 The Relationship between a Monopolist's Average and Marginal Revenue

You were informed in the introductory section of this Study Session that there are some important differences between the average and marginal revenue cost of the monopolist and the perfect competitive firm. Under perfect competition, both the marginal and average revenue curves are the same and perfectly elastic. In the case of the monopolist, both are downward sloping and they are not equal. The marginal revenue curve is below the demand curve, since the sale of an extra unit reduces the price at which all the units are sold resulting in a net addition to revenue of an amount less than its own selling price. A simple example is illustrated in Table 10.1.

Table 10.1

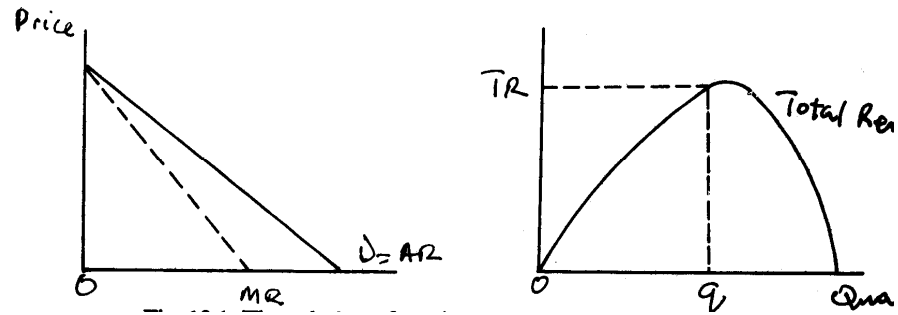
Alternative price and sales combination for a monopolist with the corresponding revenue curves.

	Price	Rate of sales per year	Total revenue	Marginal revenue	Average revenue
Scenario 1	₦30.00	100	₦3000	–	30
Scenario 2	₦29.50	102	₦3009	₦4.5	29.5
Scenario 3	₦29.00	104	₦3016	₦3.5	29

In Table 10.1, you can see that when the price of the commodity is ₦30.00, the monopolist was making a sale of 100 units per year bringing total revenue of ₦3000. However, for the monopolist to boost its sales to 102 units he has to reduce price, this reduction will not only affect the 102 units but all the previous 100 units, this will lead to increase in total revenue. However, the marginal revenue ₦4.5 is below the price and the average revenue.

The relationship between total, average and marginal revenue is illustrated below:

Fig 10.1 The relationship between total, average and marginal revenue



There are two major features of the market. First, a monopolist firm is the only producer of its product. Hence, the demand curve it faces is the market demand curve.

Hint

Secondly, the average revenue of the monopolist which is the same as the market demand curve is downward sloping. Furthermore, the marginal revenue curve is not equal to the demand curve. This second feature represents a major difference between this type of market and that of perfect competition.

ITQ

Question

Monopolist average revenue is always less than marginal revenue. True or False?

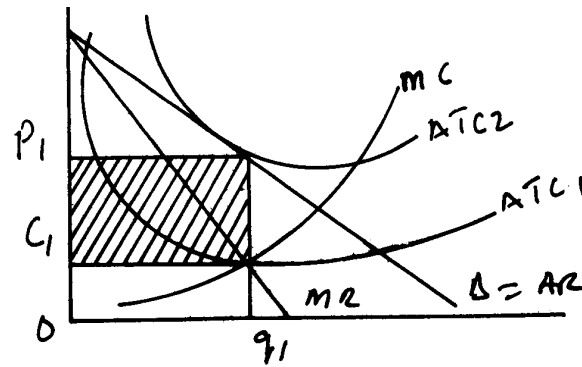
Feedback

True.

10.2 The Equilibrium of a Monopolist

The technological facts of life are the same for the monopoly as for a competitive firm, so the short run cost curves have the same stage in both cases. The difference lies in the demand conditions. While the perfectly competitive firm is faced with a perfectly elastic demand for its product, the monopoly is faced with a downward sloping demand curve.

Fig 10.2 Monopoly
Downward Sloping Demand
Curve



The equilibrium output and price are q_1 and P_1 . This equilibrium meets the several conditions for profit maximizing behaviour. Marginal cost equals marginal revenue; marginal cost cuts marginal revenue from below; and price is greater than average variable cost.

The net profit in this case is represented by the shaded portion. However, there is nothing that guarantees that a monopolist will make profit in the short run. Whether he makes profit or not depends on the position of the ATC. Where the ATC is tangential to the demand curve, the monopolist earns zero profit and output q_1 as shown below:

Fig 10.3 Short run
equilibrium position of a
monopolist with a zero
profit

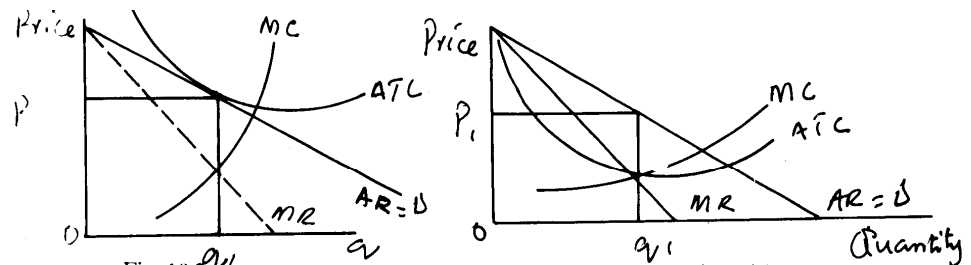


Fig. 10.3: Short run equilibrium position of a monopolist with a zero profit.

ITQ

Question

What is the equilibrium condition for a monopolist to produce?

Feedback

- A monopolist produces at the level where its marginal cost equals its marginal revenue

10.3 Firm and Industry, Short run and Long run

A monopoly is the only producer in an industry. Thus, there is no distinction between the firm and the industry. Unlike under perfect competition where there is no barrier to entry, the existence and continuous operation of a monopolist depends on its ability to bar other firms from entering into the industry where he is largely successful. There might not be much difference between the short run and long run equilibrium position of the firm. In other words, if the firm is making profit in the short run, this can also extend into the long run if it can successfully discourage other firms from coming into the market.

Reasons for the Existence of Monopolies

1. **Patent Laws:** Patent laws may create and perpetuate monopolies by conferring on the patent holder the sole right to produce a particular commodity. The government may grant a firm a charter or a franchise that prohibits competition by law.
2. **Economies of scale:** Monopolies may also rise because of economies of scale. The established firm may retain a monopoly through a cost advantage because it can produce at a lower cost than could any new and necessarily smaller competitors.
3. **Access to Raw Materials:** In a situation where one firm has the sole access to the raw material used for producing a commodity, other firms may not be able to enter into the industry
4. A monopoly may also be perpetuated by force: Potential competitors can be intimidated by threats ranging from sabotage to a price war which the established monopoly has sufficient financial resources to win.

ITQ

Question

Why do monopolists exist in any economy?

Feedback

The existence of monopolists are due to following reasons:

- Patent laws;
- Economies of scale;
- Access to raw materials;
- Force perpetuation.

10.4 Price Discrimination

In general, price discrimination occurs when a producer sells a commodity to different buyers at different prices for reasons not associated with differences in cost. For example, doctors, lawyers, barbers sometimes vary their fees according to the incomes of their clients. Cinemas also charge lower admission prices for children.

Price discrimination occurs because different units of a commodity can be sold at different prices, and it will be profitable for the seller to take advantage of this if he can.

However, for price discrimination to be possible, certain conditions must be present. First, that it can control what is offered to a particular buyer and second, that it can prevent the resale of the commodity by one buyer to another.

The first of the two conditions - control over supply is the feature that makes price discrimination an aspect of the theory of monopoly. Monopoly power in some form is necessary (but not sufficient) for price discrimination.

The second of the two conditions - ability to prevent resale tends to be

associated with the character of the product, or the ability to classify buyers into readily identifiable groups. Services are also easily resold than goods.

Equilibrium of a Price - Discriminating Monopolist

Consider a monopoly firm that sells a single product in two distinct markets, A and B. Let's also assume that there is no possibility of resale from one market to another. Since the firm can discriminate, it is under no obligation to charge the same price in market A that it charges in market B. How then will it behave in each market? The marginal cost of producing another unit for sale in market A will depend on how much is being produced for sale in market B and vice-versa. To determine what overall production should be, we need to know the overall marginal revenue, to find this we merely sum the separate quantities in each market that corresponds to each marginal revenue. The firm's total profit maximizing output is at Q_1 where MR^1 and MC^1 intersect at a value C_1 , the firm will allocate sales between the markets until the marginal revenue of the last unit sold in each market are the same.

Fig 10.4

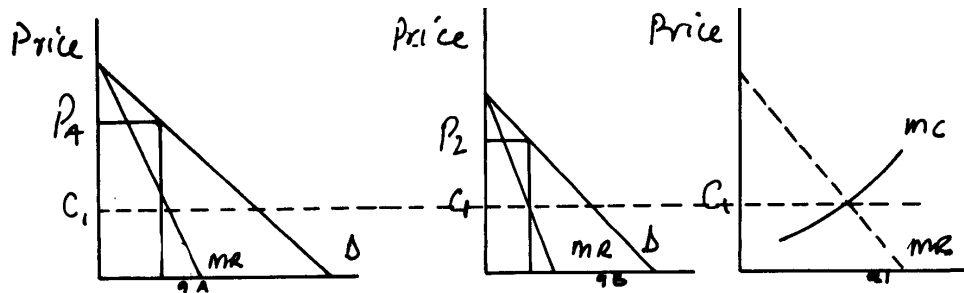


Fig. 10.4 i. Market A

ii. Market B

iii. Both Markets.

ITQ

Question

Distinguish between ordinary monopolist and price discriminating monopolist?

Feedback

- Ordinary monopolist charges same price to its customers, while discriminating monopolist charges different prices to its customers.

Study Session Summary



Summary

In this Study Session, You learnt that a monopolist is a single seller of a commodity. He can influence either the price or quantity sold of his commodity but not both.

The revenue curves under the monopolist are downward sloping and are not identical like the situation under perfect competition. The equilibrium condition of the monopolist is the same with that of a perfect competitive firm. They both produce at the point at which their marginal revenue curve intersects with their marginal cost curve. It is also possible for a monopolist to make profit both in the short and long run. The continuous existence of a monopolist depends on its ability to bar entry into the industry.

You also learnt that a discriminatory monopoly arises in a situation where a monopolist can charge different prices for different units of the same commodity, for reasons not due to cost of production.

Assessment



Assessment

SAQ 10.1 (tests Learning outcome 10.1)

John Kay Plc is a company that produces product X. X is a product that cannot be substituted with other products. John Kay has the power to determine either the price or the quantity of X to be produced. What type of producer is John Kay Plc?

SAQ 10.2 (tests Learning Outcome 10.2)

As a monopolist, at what point do you think your output is being maximised?

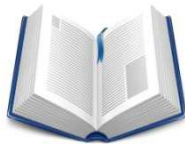
SAQ 10.3 (tests Learning Outcome 10.3)

In an economy where there is a single producer of a particular product that has no perfect substitute and this producer has the power to influence price and quantity but not both at the same time. Why do you think this producer should continue to exist in the economy?

SAQ 10.4 (tests Learning Outcome 10.4)

- A. Distinguish between ordinary monopoly and price discriminatory monopoly.
- B. Consider a monopoly firm that sells a single product in two distinct markets, A and B. Let's also assume that there is no possibility of resale from one market to another. Since the firm can discriminate, it is under no obligation to charge the same price in market A that it charges in market B. How then will it behave in each market?

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Study Session 11

The Theories of Imperfect Competition

Introduction

In the last two previous Study Sessions, we discussed two extreme types of markets. However, you would realise that the two markets, that is, monopoly and perfect competition are not common in the real world rather what one sees around is the mixture of the two extremes. The attempt to be more relevant to reality gives rise to the study of the imperfect competition. You will now examine the theories relating to imperfect competition in this Study Session.

Learning Outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 11.1 *highlight* the characteristics and behaviours of the monopolistic-competition.
- 11.2 *explain* equilibrium condition of an oligopolistic.

11.1 Monopolistic-Competition

Hint

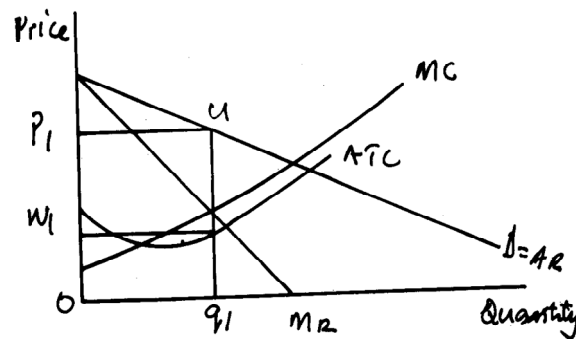
While under perfect competition, sellers face a perfectly elastic demand curve and they are price takers. In all other market forms, say for example, the monopolist, monopolistic-competition and oligopoly, the firms have some control over their price. In such circumstances we say that the firms in the latter category can administer their own prices.

The term monopolistic-competition describes a situation similar to perfect competition, with the singular important difference that each producer sells a product that is somewhat differentiated from the products sold by his competitors.

Product differentiation implies that each firm does not face a perfectly elastic demand curve. The firm is faced with a downward sloping demand curve; implying that if the firm raises its price it will lose business to its competitors, but it will not lose all of its customers just because its prices rise slightly (because he sells a differentiated product). The slope of the demand curve will however depend on the extent to which the firm's product is differentiated from its competitors.

The figure below denotes the short run equilibrium of the firm. The firm is faced with a downward sloping but rather flat, demand curve. The firm will of course, have the usual U-shaped short run cost curve. The short run equilibrium of the firm is exactly the same as that of a monopolist. The firm is not a passive price taker; it may juggle price and quantity until profits are maximized. This occurs at output q_t and price P_t in the Fig 11.1.

Fig 11.1 The short run equilibrium of a firm

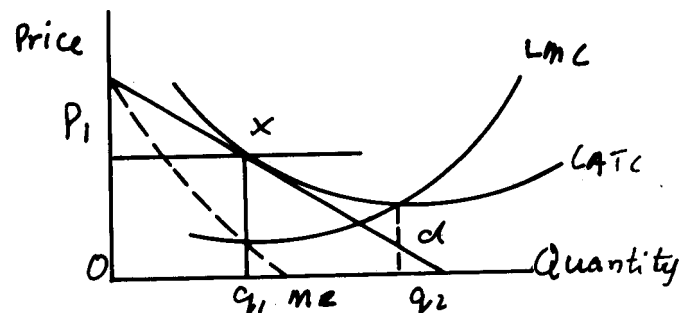


11.1.1 Long Run Equilibrium

The firm shown in the figure above is earning profits equal to $P_1 UVW_1$ and if it is typical of the other firms in the industry, new entrants will be attracted. As more firms enter, the market demand for the product must be shared out among the larger number of firms, so that each can expect to have a smaller share of the market. Thus, at any given price, each firm can expect to sell less than it did before the influx of new firms; each firm's demand curve shifts left. This must continue until no profits are being earned; as long as profits exist, there is an attraction for new firms to enter and the industry will continue to expand.

The final position must be like what is indicated in the figure below. The demand curve touches the average total cost curve at only one point, x , corresponding to quantity q_1 and price P_1 : the demand curve is tangential to the average cost curve at point x . At this output, cost is just being covered, since average revenue equals average total costs. Losses occur at any other level of output, since average revenue is less than average total costs.

Fig 11.2 The Long-run Equilibrium of a Firm under Monopolistic-Competition



Two major lessons are derived from this equilibrium position. The first is that despite the fact that the monopolistic-competitive firm is faced with a downward sloping demand curve; zero profit equilibrium is still possible. The second lesson is that the firm now operates at a position of excess or unused capacity. Although the firm could expand its output to q_2 and thus reduce its ATC, but this does not pay the firm since the fall in price would be greater than the fall in costs. Thus, the best position to operate is denoted by x above.

Advertising Expenditure

Firms operating monopolistic competition engage in advertising as a means of differentiating their products from others. A relevant question

is, how much should a profit maximizing firm spend on advertising?

A very simple model expresses quantity sold as a linear function of advertising expenditure and assumes diminishing marginal returns to advertising. An additional assumption is that changes in advertising do not alter price or marginal cost

If price is denoted by P and marginal cost by MC , then the gross marginal profits is $P-MC$. By deducting additional advertising outlay from this we obtain net marginal profit

To maximize total net profit, the firm must ensure that advertising expenditures are at the level where an extra gross profit equals to the extra naira of advertising cost. In other words, if ΔQ is the number of extra units of output sold due to an extra naira of advertising, advertising expenditures must be such that

$$\Delta Q = (P - MC) = 1$$

Where the right hand side represents the extra naira spent on advertising and the left hand side is the marginal gross profit due to the last advertising naira. If both sides of the equation above are multiply by $P/P-MC$, we obtain

$$P\Delta Q = \frac{P}{P - MC}$$

Since for profit maximization MR must equals to MC , the equation can be written as

$$P\Delta Q = \frac{P}{P - MR}$$

Given that $MR = P \{1-1/E_d\}$

$$\frac{P}{P - MR} = E_d$$

While $P\Delta Q = MR$

In other words for profit to be maximized, marginal revenue has to be equated with the elasticity of demand.

ITQ

Question

Highlight the characteristics and behaviour of monopolistic competition.

Feedback

- Product differentiation
- Active involvement in price setting

11.1.2 Differences between Perfect Competition and Monopolistic-Competition

1. This is a derivative of our discussion above. The equilibrium output of the monopolistically competitive firm is less than the output where total cost is at a minimum. (This is known as excess

- capacity theorem).
2. Under monopolistic-competition, equilibrium price is higher and output is lower, *ceteris paribus*, than under perfect competition.
 3. Under monopolistic-competition, equilibrium price is greater than marginal cost.
 4. Monopolistically competitive firms will offer wider variety of brands, styles and possibly qualities than firms in perfect competition.
 5. Monopolistically competitive firms will engage in non-price competition whereas perfectly competitive firm will not.

11.2 Pricing and Output under Oligopoly

Oligopoly refers to a market situation where there are few sellers of a particular commodity such that the activities of one of the sellers are particularly important to the others. The pricing, output, sales promotional activities of a seller must take the reactions of others into account. Usually, a single seller occupies a position of sufficient importance (market leader) in the product market for changes in his market activities to have repercussions on others.

Oligopolies can be classified according to the degree of collusion achieved by the three:

- i. organised collusive oligopoly;
- ii. unorganised collusive oligopoly; and
- iii. non-collusive oligopoly.

The first one refers to a cartel arrangement whereby a central organisation is set up which determines the output and pricing arrangement among members of the cartel. A good example of this is the Organisation of Petroleum Exporting Countries (OPEC).

The second category goes on an informal basis. There is a gentleman agreement among members as to prices and output decisions. However, this might not be binding on members who can flout this decision and yet escape prosecution.

The third category is a pure oligopolistic system whereby firms take independent actions of their own. Activities of any of the firms can lead to bitter rivalry among the firms, for instance, a price war.

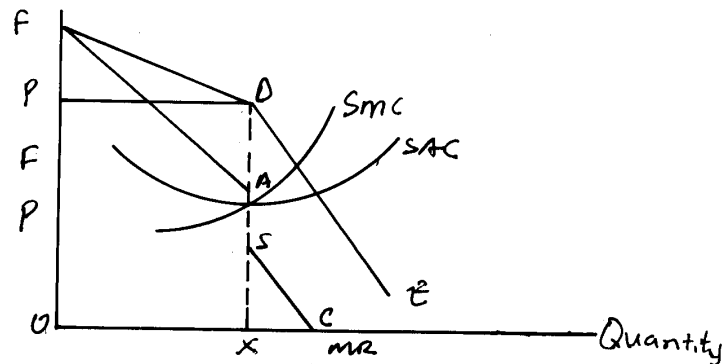
11.2.1 Short Run Equilibrium

For our purpose we shall take the case of non-collusive oligopoly. This one is characterised by price wars and price rigidity. One seller may lower his price to increase sales. This takes customers away from rivals and they may retaliate with a vengeance. The price war may spread throughout the industry with each firm trying to undercut the others. The end result may be disastrous for some individual firms.

The 'kinked' demand curve is the analytical device frequently used to explain oligopolistic price rigidity curve. The framework is however based on certain assumptions. First, that the industry is a mature one, either with

or without product differentiation. A cluster of prices or a price fairly satisfactory to all has been established. Second, if one firm lowers price, others will follow or undercut it in order to retain their shares of the market. Thus, price decreases might not work to the advantage of the firm. Third, if one firm increases prices, other firms may not follow the price increase. This firm would lose his customers to other firms who have not increased their prices.

Fig 11.3 The Short Run Equilibrium Position of an Oligopolistic Firm



The demand curve faced by a single firm in such a situation is pictured diagrammatically in the figure below as FDE.

The firm has established a price at P. If it reduces its price below P, other firms follow and it retains his share of the market. The demand curve faced by the firm for price increases is PD. The demand curve FDE is not smooth but is kinked at the established price P.

The kinked demand curve has implications for the marginal revenue of the firm. The MR curve is discontinuous at output X. The portion of the MR curve FA and SC corresponds to the two portions of the demand curve FD and DE respectively.

Cost curves SAC and SMC are such that at price P some profit can be made. The MC curve cuts the MR curve within its discontinuous part. Output X and price P are, in fact, the firm's profit maximizing output and price. If output were less than X, MR would exceed MC and the firm's output would be increased by expanding output to X. For outputs exceeding X, MC exceeds MR and profits will decrease.

One implication of the discontinuity in the MR curve of the oligopolistic firm is that as long as MC cuts MR curve at the discontinuous part of the marginal revenue curve, there is no incentive for the oligopolist to change either price or output. e.g. SMC

ITQ

Question

The demand curve faced by oligopolistic producers is referred to

as _____.

Feedback

A kinked demand curve

11.2.2 The Long Run

Two types of adjustments are possible in oligopolistic industries in the long run. In the first place, individual firms are free to vary the size of their plant; thus the relevant cost curves for the firms are the long run average cost curve and the long run marginal cost curve. Second, some industry adjustment may be possible in the form of entry into the industry or exit of old firms from the industry. Non-Price Competition:

While Oligopolists may be reluctant to encroach upon each other's market shares by lowering product price, they appear to use other methods to achieve this. Product differentiation offers a more subtle and a much safer way of accomplishing approximately the same results, Product differentiation occurs in two major ways:

1. Advertising; and
2. Variation in design and quality of product.

ITQ

Question

What are Non-price competition strategy oligopolistic firm usually adopt to gain the market?

Feedback

- Advertising
- Variation in design and quality of product.

Study Session Summary



Summary

In this Study Session, we noted that monopolistic-competition refers to a market situation where there are many sellers of slightly differentiated products. This type of market is very common in the real life. Like a monopolist, the firm in this type of market is faced with a downward sloping demand curve. While the short run equilibrium of the firm is similar to that of the monopolist, in the long run, no firm in the industry could make profit. Any presence of positive profit will attract other firms into the industry bringing about increase in market supply and a fall in price. This will continue until all excess profit has been wiped off.

You also examined oligopoly - a market situation where there are few sellers of a particular commodity such that the activities of one of the sellers are particularly important to the others. Three types of oligopolies were identified during the course of the study. They are:

- i. organised, collusive oligopoly
- ii. unorganized collusive oligopoly, and
- iii. non-collusive oligopoly.

A major feature of this type of market is the use of price wars and price rigidity.

Assessment



Assessment

SAQ 11.1 (tests Learning Outcome 11.1)

Highlight the characteristics and behaviours of the monopolistic-competition.

SAQ 11.2 (tests Learning Outcome 11.2)

Describe equilibrium condition of an oligopolistic firm.

Study Session 12

Theory of Distribution

Introduction

In this Study Session, we shall explore the theory of distribution. We will examine how factors determine the returns earned by each factor of production. Specifically, you will learn about the factors that determine the demand for, and the supply of factors of production and how demand and supply consideration helps in determining the true quantity and income of factors of production. You will also examine how wages earned by labour is determined and the dynamics of price determination by market forces.

Learning outcomes



Learning Outcomes

When you have studied this session, you should be able to:

- 12.1 *factors* that influence the demand and supply of factors of production.
- 12.2 *outline* how wages are determined under different market situations.
- 12.3 *explain* why different or the same factors earn different prices.

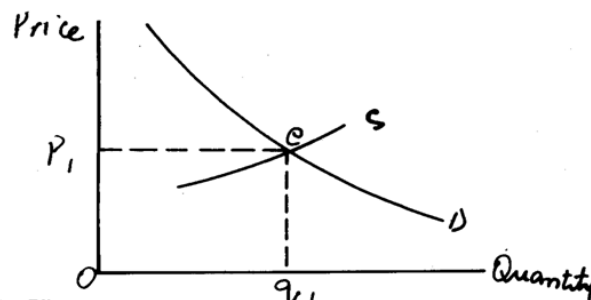
12.1 Demand for and Supply of Factors of Production

12.1.1 Theory of Production

For their part in the production process, the factors of production receive income. Functional distribution of income relates to how this income is then shared among the factors of production. However, when we classify income according to the totality of income we are dealing with size income.

The traditional theory states that distribution is simply a special case of price theory. The income of any factor of production depends on the price that is paid for the factor and the amount that is used. In this **neutral conception of distribution**, income received by a factor is simply its price multiplied by the amount of the factor used.

Fig 12.1 The determination of the price, quantity and income of production



In Fig. 12.1, the price and quantity of the factors are p_1 and q_1 respectively. The total income earned by this factor is then equal to the rectangle Op^1eq_1

The Demand for Factors

In order to produce commodities, firms require the services of factors of production such as land, buildings, raw materials, machine and equipment, etc. The demand for these factors is however conditioned on the demand for the commodities which they help to produce. Thus we say the demand for factors of production is DERIVED DEMAND. The aggregate derived demand for a factor in all its productive activities gives the total demand for the factor.

The Quantity or Factor Demanded in Equilibrium

The principle governing the operation of profit maximizing firms such as monopoly and perfect competition as we have discussed in earlier lectures is also true when it comes to their purchase of factor inputs. While it is true that these firms produce at the point at which marginal cost equals marginal revenue, so it is true that all profit maximizing firm, will hire a unit of the variable input up to the point at which the marginal cost of the factor (i.e. the addition to the total cost resulting from the employment of one more unit) equals the marginal revenue is however distinguished from the one under production by referring to it as marginal revenue product.

Marginal revenue product is defined simply as the addition to total revenue by the employment of one additional unit of the input. This equilibrium condition for the profit maximizing firm can be written as:

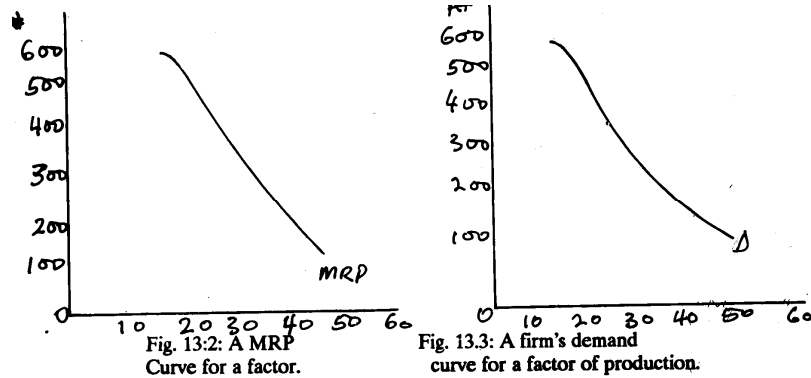
$$\begin{aligned} \text{Marginal cost of the variable factor (MC)} \\ = \text{marginal revenue products of that factor (MRP)} \end{aligned}$$

Under perfect competitive market, the marginal cost, for example, of employing one extra person on the payroll is the wage that must be paid to the person.

The Derivation of the Demand Curve from the Marginal Revenue Product Curve

To derive demand curve from the marginal revenue product (MRP), two assumptions are made, first, that the firm is a price taker (in factor markets) and secondly, there is only a single variable factor of production. This allows us to use condition (2) to derive the firm's demand for a factor as soon as we have the MRP curve. Figure 12.2 shows a MRP for some factors. This shows how much would be added to revenue by employing one more unit of the factor for each level of total employment of the factor, Condition (2) states that the profit maximizing firm will employ additional unit of the factor up to the point which the marginal revenue product equals the price of the factor.

Fig 12.2



If for example, the price were N400 per year, it pays to employ 30 workers. (There is no point in employing a 31st worker since that would add just less than N400 to revenue but N400 to costs, and hence would reduce total profits).

The curve in Figure 13.3 shows the quantity of labour employed at each price of labour. This is similar to the MRP case. For example at N400 per year, the firm will also employ 30 workers. Since Figure 11.3 relates price of the variable factor to the quantity employed. Hence, it is the demand curve for the variable factor. Thus, the marginal revenue product curve of a factor has the same shape as the firm's demand curve for that factor.

Composition of the Marginal Revenue Product Curve

It is made up of two components, first, the physical component called the Marginal physical product (MPP), which is the extra output produced by successive increment of the variable factor.

And secondly, the value component called the marginal revenue product (MRP). In order to be able to convert the MPP into MRP, we need to know the value of the extra physical product. There are two cases to consider, in a perfectly competitive market the price is given, and it accurately measures the value of an additional unit to the firm. That is under perfectly competitive firm.

$$\text{MRP} = \text{MPP} \times \text{Price of the Product.}$$

If on the other hand, the firm faces a downward sloping demand curve for its product, the value to the firm of an extra unit of output will be less than its price, because to sell the extra unit it will have to reduce the price of all other units to be sold. Thus, we have

$$\text{MRP} = \text{MPP} \times \text{MR associated with the sale of extra unit.}$$

Supply Factors

This relates to the factors determining total effective supply of land, labour, natural resources or capital to the economy.

Labour

The number of people willing to work is called the labour force; the total number of hours they are willing to work is called the supply of labour. The supply of labour is a function of three things:

- a. **Population:** Populations vary in size, and these variations are influenced to some extent by economic factors. For instance, birth rate might be higher during good times than in hard times. Much of variations in population, is however, explained by factors outside of economics.
- b. **The Labour Force:** The labour force varies considerably in response to variations in the demand for labour. Generally, a rise in the demand for labour, and an accompanying rise in earnings will lead to an increase in the proportion of the population willing to work.
- c. **Hours worked:** The number of hours worked contributes to the supply of labour, recently, increased in real wages in most western countries leads household to consume more commodities and also to consume more leisure. This means that they are willing to work fewer hours per week and thus a decline in the supply of labour.

Land

If by 'land' we mean the total area of dry land, then its supply is pretty well fixed. Rise in earnings of land cannot result in much of an increase in supply, unless land under water can be drained. The traditional assumption in economics is that the supply of land is absolutely inelastic. However, if by 'land' we meant all the fertile land available for cultivation then the supply of land is subject to large fluctuations. Considerable care and effort is required to sustain the productive power of land, and if the return to land is low, its fertility may be allowed to be exhausted within a short period of time. On the other hand, a high return to land may provide incentives for irrigation, drainage and fertilization schemes that can greatly increase the supply of Arable land. Land is also usually defined to include the natural resources found in or on it.

Capital

Capital is a man-made factor of production. The supply of capital in a country consists of the existing machines, plants, equipments, etc. and it is called the capital stock. This capital is used up in the course of production and the supply is thus diminished by the amount that wears out. The total amount of capital goods produced is called Gross Investment. While net additions to the capital stock, are called Net Investment and expenditure on capital goods is called Investment Expenditure.

The supply of capital has been observed to increase considerably over time in all modern countries. The volume of net investment determines the rate of increase of the capital stock. There is considerable evidence that net additions to the stock of capital vary considerably over the trade cycle, being low in periods of slump and high in periods of boom.

Factor Mobility

Hint

This refers to the readiness of factors to respond to signals that indicate where factors are wanted. If a factor is highly mobile in the sense that owners will quickly shift from the use of A to B in response to a small change in the relative factor price, then supply will be highly elastic and vice versa.

ITQ**Question**

What are factors that influence the demand and supply of factors of production?

Feedback

Demand for factors

- The quantity or factor demanded in equilibrium
- The derivation of the demand curve from the marginal revenue product
- Composition of the marginal revenue product

Supply of factors

- Labour
- Land
- Capital

12.2 Wages and Collective Bargaining

12.2.1 The Determination of Wages without Unions

In the absence of labour unions, the determination of wages depends on the type of market situation. There are two types of market situations. The first is where labour is supplied and demanded competitively. The second market situation is where supply of labour is done competitively but demanded monopolistically. We shall consider each of these situations separately.

Case 1: When labour is supplied and demanded competitively

Under perfect competition there are many buyers and sellers of labour such that no one can influence the wage. In such a case, it is the forces of demand and supply that determines the ruling wage rate in the market and also the size of labour employed. This situation is illustrated in the figure below.

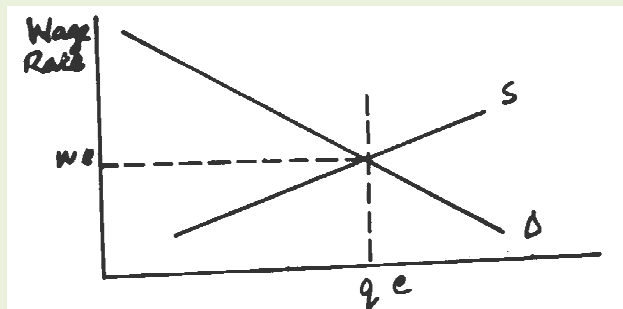


Fig. 12.3: The determination of wages in a competitive market.

In this figure, the market wage rate is W_e and total quantity of employment is q_e .

Case 2: When labour is supplied competitively and demanded

monopolistically.

Monophony refers to a market situation where there is only a *single buyer* in the market. In a situation where labour is demanded monopolistically, the monopsonist can offer labour any wage rate she pleases. Workers are however free to work at such wage rate or to seek employment in other markets.

In fixing its wage rate, the monopsonist is guided by his marginal cost curve which is also the supply curve. The monopsonist who is a profit maximising firm will always equate the marginal cost of labour with its marginal revenue product. He will continue to hire labour until this equality is achieved

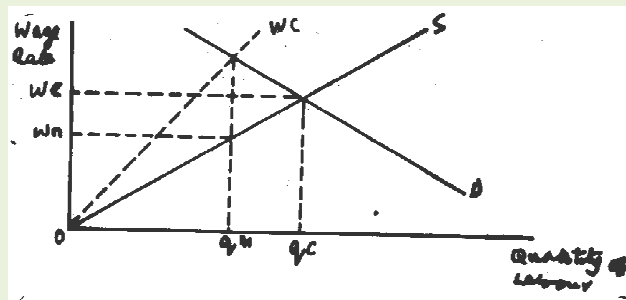


Fig. 12.4: The determination of wages when labour is sold competitively but bought monopolistically

At equilibrium, the monopsonist will equate marginal cost with the marginal revenue product and not the wage. But because marginal cost exceeds the wage rate, it follows, that the wage rate will be less than the marginal revenue product. Also, since the supply curve of labour is upward sloping, the volume of employment input will be less than it would be under perfect competition.

This analysis is illustrated in the figure above where W_c and q_c are the competitive wage and the volume of employment, while wage W_m and q_m are the corresponding position under monopsony. Since the monopsonist wishes to employ a quantity of labour equal only to q_m , she needs to pay a wage of only W_m to call forth that quantity. Thus, monopsony results in a lower level of employment and a lower wage rate than when labour is purchased competitively

ITQ

Question

Highlight how wages are determined without unions

Feedback

- Forces of demand and supply of labour in a competitive market

12.2.2 The Determination of Wages with Unions

For the moment let's assume that the union can fix any price of labour that it wishes by unilateral action or by negotiation, but that the volume of employment is determined by the amount employers wish to hire at the union determined wage.

Case 3: When Labour is supplied monopolistically but Purchased Competitively

Let's assume that a union enters the competitive market and attempts to raise the wage above its equilibrium level. See the figure below:

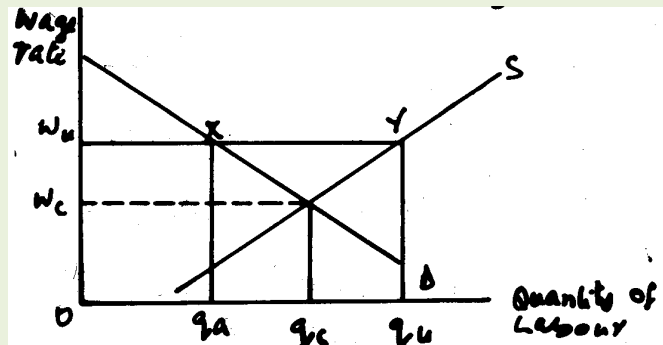


Fig 12.5: The Effect on Wages and Employment of the entry of Union into a Competitive Market.

As shown in Fig.14.3 above, if the union raises the wage from W_c to W_u this creates a perfectly elastic supply of labour up to the quantity q_u . The supply curve now becomes W_u, Y and equilibrium is at x where the demand curve cuts the new supply curve. The union has succeeded in raising the wage rate above its competition level, but at a cost of reducing employment q_c to q_a .

Case 4: When Labour is Supplied monopolistically and demanded Monopsonistically

Given a demand, supply and marginal cost curves as shown in the figure below, it can be proved that in this market, the union can raise wages by - substantial margin and at the same time raise the volume of employment.

In the figure, the wage and employment levels without a union are W_m and q_m . Now assume that the union negotiates a wage of W_1 . This creates the kinked supply curve $W_1 x S$ and a marginal cost curve $W_1 x_y MC$. The monopsonistic purchaser of labour will now be in equilibrium of employment q_t , since up to that level of employment the marginal cost of labour is less than the marginal revenue product, while for levels above q_t , the reverse is true. The union has raised both wages and employment.

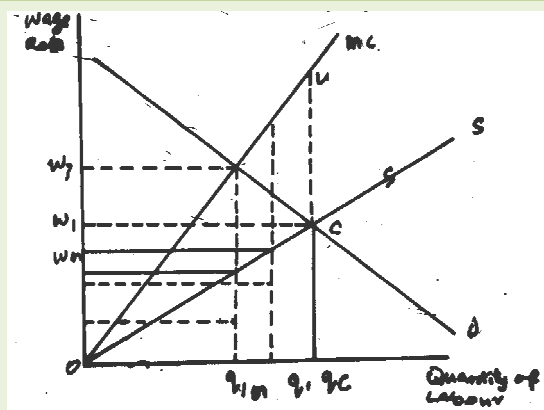


Fig.12.6: The Effect on Wages and Employment of the entry of a Union into a Monopsonistic Labour Market

The above result is achieved because before the entry of the union, the monopsonist purchases kept employment down because it was aware of those already employed. The introduction of the union wage now faces the purchaser with a perfectly elastic supply curve, so that there is no point in keeping employment low for fear of driving up the wage.

12.2.3 Collective Bargaining

The term collective bargaining refers to the whole process by which unions and employers (or their representatives) arrive at and enforce agreements. It usually describes a situation of monopoly versus monopsony in which there is one seller, the union, and one buyer, either a single firm or an employers' association.

Under collective bargaining both sides must agree to the wage. There is always a substantial range for compromise. In particular cases, the actual range will depend on the goals of the two negotiating parties.

Methods and the Objectives of the Modern Union Wages

The major objective of modern unions is to seek and obtain a favourable wage rate for their members. Unions try to achieve this by using either or a combination of two alternatives. The first is to try to determine the quantity of labour supplied and then let the wage be that which equates to demand and supply.

The second policy is to restrict entry into the occupation by methods such as lengthening apprenticeship periods and rationing places for trainees. Such tactics will make it more expensive or otherwise more difficult to enter the occupation. Thus, at any given wage rate, the quantity supplied will be reduced; and the supply curve shifts to the left and thus wage rate increases.

Which of the two tactics that will appeal to a particular union will depend on many factors, such as the ease with which supply can be restricted, the ease with which unions wages can be negotiated and enforced, and the public reactions to these two tactics in particular situations.

Wages versus Employment

In many cases (as shown in our previous examples), the union faces a trade off between wages and employment. But in some cases it is possible

to avoid the conflict by bargaining with the employer about both wages and employment. This can be accomplished by meaningful agreements thereby forcing employers to use more labour than they need for a given level of output; such agreements are very common in the U.K.

Wages versus Job Security

Union leaders are also much concerned about job security of their members. They adopt both defensive and offensive attitude to the labour market.

ITQ

Question

What do you understand by the term “collective bargaining”

Feedback

The term collective bargaining refers to the whole process by which unions and employers (or their representatives) arrive at and enforce agreements.

12.3 The Pricing of Factors in Competitive Markets

A distinguishing feature of the market economy is that resources allocation is done by the forces of demand and supply. Not only does the market determine the amount of commodities bought and sold but it also determines the prices paid to factors of production and the total income received by each factor.

12.3.1 Pricing of Factors in Competitive Market

Under the traditional theory of factor pricing, factor prices are determined at the point at which their demand is equal to the quantity of factor services supplied.

Given a hypothetical situation, when there is only one factor of production in which all these units are identical and also subject to the same conditions of service, then one would expect that there will be mobility. From occupations with low prices to occupations with high price and that this process will continue until the price paid to the factor is the same in all its uses.

However, in real life, a number of factors combine to make the discussions above an ideal "case. Looking around you; you will see different units of the same factor, say labour are paid different amounts in different Occupations. Several reasons account for this.

1. The difference in the quality of labour in terms of experience and skill. A university graduate deserves to earn more than a non-graduate in the same job, all things being equal.
2. Workers in growing industries often earn higher pay than their counterparts in declining industries. Perhaps, the attractiveness of a banking job to many people today can be a good illustration of our point here.
3. The social prestige associated with different occupation. For

instance, an individual in the academics might be willing to earn less than his counterpart in the private sector because of the social prestige which is attached to being a university don.

4. Differences in the degree of difficulty or unpleasantness of the work. For example miners work under unpleasant conditions relative to farmers
5. Differences in the risk of occupation. For example a racing driver or an air plane pilot runs more Risks than a college teacher
6. Differences in the stability of employment. Construction work and athletic coaching are subject to frequent layoffs and hence have little job security, whereas tenured university teachers have a high level of job security.

ITQ

Question

What are the reasons people earn different wages?

Feedback

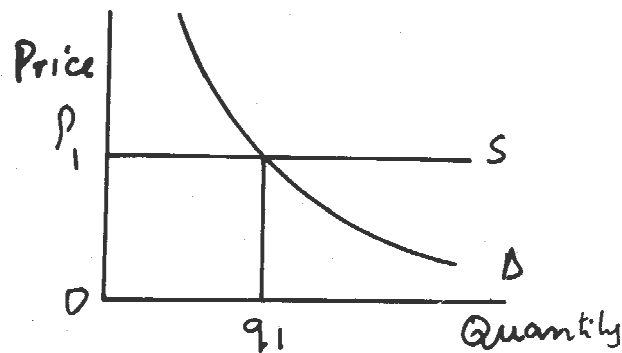
- The level of education
- The skills and experience acquired
- Differences in stability of employment
- The social prestige associated with different occupation
- The risk associated with the job

12.3.2 Transfer Earnings and Economic Rent

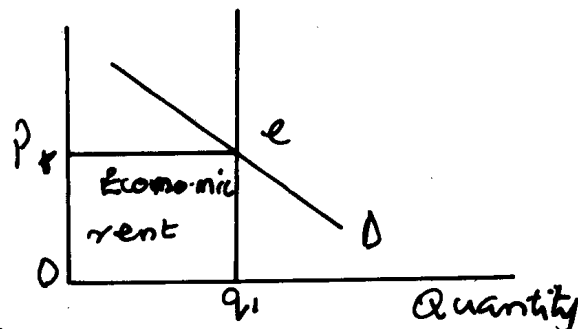
The discussions on earnings of factors bring us to the difference on transfer earnings and economic rent. Transfer earnings are the amount that a factor must be paid in order to remain in its present place of employment. It is the minimum price that the factor is willing to take to continue in employment.

Economic rent on the other hand is the amount which a factor receives in excess of these transfer earnings. It is the difference between the factor's actual earnings and its transfer earnings.

In real life, the total amount which a factor is paid is a composite of these two types of payments. It is possible, however, to imagine limiting cases in which all earnings fall into either of these categories. Consider the case of a firm which is faced with a perfectly elastic supply curve of a factor of production; it will be possible to obtain any quantity of this factor at the going rate but, at any lower price, it will be unable to obtain any of the factors. In such a case, which is illustrated in Fig. 15.1, the whole price paid to the factor represents transfer earnings.

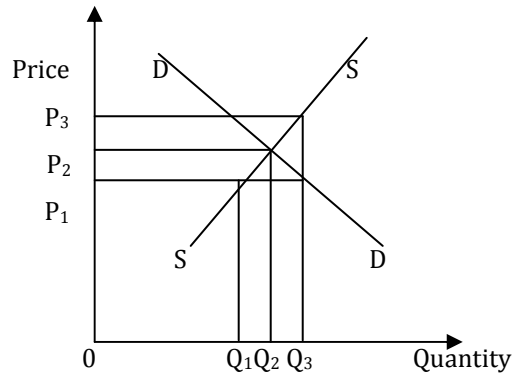
Fig 12.7 Transfer earning

All of the incomes earned by the factor are transfer earnings. Let us consider another case, say that of a factor which the owner put up for sale at any price on the belief that any earnings, is better than nothing at all. Let us assume further that the supply of this factor is fixed and the factor is owned by several people such that there is no incentive for any of the owners to withhold his supply. In this case, the whole amount paid to the factor is economic rent because even if a lower price were paid the factor would still be supplied. Figure 12.8 below illustrates this analysis.

Fig 12.8 Economic rent

In the figure above, the total earnings which is equal to the rectangle $O P e q_1$ is economic rent. We have said earlier on that most of the earnings in real life are made up of economic rent and transfer payments. This is a normal feature for normal behaved demand and supply curves. All the areas below the supply curve represents transfer earnings and others above the supply curve up to the equilibrium price represent economic rent. Some of the factors earned by the factor are transfer earnings and the remainder is an economic rent. The figure below illustrates our argument here

Fig 12.9 Transfer Earning and Economic Rent



P_2 and Q_2 represent equilibrium price and employment level respectively. The prices represent the amount that will guarantee the employment of the total labour q_2 . For each unit below the total employment q_3 , say q_2 , the workers would be prepared to receive a price less than p_3 i.e. p_2 , but since all the workers q_3 would now be paid p_3 , therefore, the amount above p_2 to p_3 represents economic rent to all q_2 workers.

The following example will drive home our point here: If universities increase the salary paid to lecturers in Economics Department in order to attract additional economists away from industry and government into university teaching, those economists, persuaded to make the switch will be receiving only transfer earnings. But those economists who were already in employment as economics lecturers will find that their salaries have increased as well, and for them this increase will be economic rent.

ITQ

Question

Distinguish between transfer earnings and economic rent.

Feedback

Transfer earnings are the amount that a factor must be paid in order to remain in its present place of employment.

Economic rent on the other hand is the amount which a factor receives in excess of these transfer earnings.

Study Session Summary



Summary

In this Study Session, you explored the fundamentals of income determination in a market economy. The income to a factor of production is simply the product of its price and the quantity supplied. Profit maximizing firms would employ a factor up to the point at which its marginal cost is equal to its marginal revenue product. You also learnt the reasons why different units of the same factor could be paid different prices in different occupations. These reasons include social factor, differences in quality and skill of these different units and the industry environment.

Assessment



Assessment

SAQ 12.1 (Tests Learning outcome 12.1)

State the factors that influence the demand and supply of factors of production.

SAQ 12.2 (Tests Learning outcome 12.2)

Outline how wages are determined under different market situations.

SAQ 12.3 (Tests Learning outcome 12.3)

State why different or the same factors earn different prices.

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Reading

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Feedback to Self Assessment Questions

SAQ 1.1

The study of economics dates back to the time of Aristotle who described it as *oikonomique*. The classical economists treated economics as political economics. However, from the time of Alfred Marshall, economics assumed the specialised form for which it is known today. In other words, it attempted to remove itself from the value/ethical consideration and move more in the direction of scientific analysis.

SAQ 1.2

Many economists have attempted to define economics from a narrow perspective and thereby leaving out the main substance of the subject matter. Aristotle considers economics "as the study of the household". Marshall defines it as the "study of mankind in the ordinary business of life".

Although these definitions one way or the other deal with some aspects of the subject matter, they however leave out the central problems which are scarcity, choice, accumulation and capital utilization.

A more appropriate definition has been given by Lord Lionel Robbins. He defined economics as the "science which studies human behaviours as a relationship between **ends** and **scarce means** which have **alternative uses**."

SAQ 1.3

In any society, economist faced different various problems. These are:

- 1) What to produce: Economists want to determine which commodities to produce and in what quantities.
- 2) How to produce: what methods of production to use in producing these commodities
- 3) For whom to produce: for whom the goods are to be produced i.e who are the potential buyers of the commodities to be produced and where can they get the buyers.
- 4) Are resources fully or efficiently utilized: Economist want to know whether the resources of the country are being fully utilized, or otherwise.
- 5) Which production technique is suitable in terms cost of production and efficiency of production.
- 6) How resources are to be efficiently distributed to maximize the societal welfare.

SAQ 1.4

Economics as a science focuses on human behaviour in order to determine how scarce resources are to be efficiently utilized. In doing

this, economists observe real world phenomena and develop suitable models to understand and simplified intricacies of real life situations. Based on observations, hypotheses are formulated and data are collected. Also, hypotheses are tested using suitable analysis and predictions will be made. These methods of testing facts made economics a science even though the whole wide world is its laboratory.

SAQ 1.5

These can be categorised into:

- 1) Functional relationship e.g mathematical function or graph
- 2) Logical influence based on reasoning which leads to formulation of economic theories.

SAQ 2.1

1. Household is the smallest economic unit. The main objective of the household is to maximize its satisfaction. All decisions in the household are geared towards the fulfillment of this objective. In addition, it is assumed that all resources in the economy are owned by the household.

2. Firm is the second principal agent in the economy. They are charged with the responsibility of turning inputs into outputs of goods and services. They do this by purchasing resources from the households. The goal of the firms is the maximization of their profits.

3. Central authorities embody all the agents and institutions of the government. That is, the police, the civil service, public corporations and other bodies owned or under the control of the government.

SAQ 2.2

In the market, price mechanism is used to allocate resources. In a free market economy characterizes by perfect competition, the forces of demand and supply allocates resources through price mechanism. Market price serves to determine how much consumer buys and producer sells in a market.

SAQ 2.3

In a free market economy, the intersection of demand and supply bring about equilibrium in the market. This equilibrium uniquely determines the market price. Any price above the equilibrium leads to excess supply; while any price below equilibrium creates excess demand.

Demand and supply are only equal at the equilibrium point. At this point, quantity demanded and quantity supplied is equal. At this point, the quantity the sellers are willing to sell equal to the quantity the buyers are prepared to buy. In this situation the market is cleared and excess demand and supply are zero.

At any other price above or below equilibrium price, there is excess supply or excess demand respectively. When there is excess demand,

households will be unable to buy all they demand; when there is excess supply, firms will be unable to sell all they wish to supply. In both cases there is no harmonization of activities.

When there is excess supply, producers unable to sell all they brought into the market will be forced to reduce their prices. As they reduce their prices, demand will increase and this will continue until price falls to equilibrium price, in which case demand will be equal to supply.

On the other hand, when there is excess demand, for example, at price below equilibrium price demand is greater than supply. This will make households to compete among themselves offering higher prices. These higher prices would induce supplies.

SAQ 3.1

Using our elasticity formula to derive the elasticity of demand for bread:

$$\begin{aligned}\eta &= (-1) \frac{\Delta q/q}{\Delta p/p} \\ \eta &= (-1) \frac{100 - 400/500}{50 - 20/20} = (-1) \frac{-300/400}{30/20} \\ \eta &= (-1) \frac{-300 \times 20}{400 \times 30} = \frac{6}{12} \\ &= 0.5 \text{ (inelastic)}\end{aligned}$$

However, the above is for an increase in the price of commodity X.

For commodity Y, the elasticity is calculated below

$$\begin{aligned}\eta &= (-1) \frac{\Delta q}{q} \frac{P}{\Delta P} \\ \eta &= (-1) \frac{100 - 200/200}{150 - 100/100} = (-1) \frac{-100/200}{50/100} \\ &= \frac{(-1) - 100 \times 100}{50 \times 200} \\ &= \frac{10000}{10000} \\ &= 1 \text{ (Unitary elastic)}.\end{aligned}$$

Commodity X is inelastic while commodity Y is unitary elastic. This implies that the percentage change in quantity of commodity X due to change in the price of commodity X is less than the percentage change in the price of commodity X. While the percentage change in quantity of commodity Y due to change in the price of commodity X is the same as the percentage change in the price of commodity Y.

SAQ 3.2

$$Es = \frac{\frac{\text{New supply} - \text{Initial supply}}{\text{Initial supply}}}{\frac{\text{New price} - \text{Initial price}}{\text{Initial price}}}$$

Using our elasticity formula above, we can derive the elasticity of supply for soap X

$$\begin{aligned} & \frac{\Delta q}{\Delta p} \frac{P}{q} \\ &= \frac{\frac{400 - 300}{300}}{\frac{20 - 15}{15}} = \frac{\frac{100}{300}}{\frac{5}{10}} \\ &= 0.66 \text{ (inelastic)} \end{aligned}$$

This means that percentage change in the quantity of soap X supplied is less than the percentage change in the price of soap X.

SAQ 3.3

These are:

- Availability of close substitutes
- Luxury and Necessities
- Durability/ Time
- Habit

SAQ 4.1

This can be shown using the concept of marginal utility. From the utility schedule given in the table 4.1 inside the test, if total utility is increasing at a decreasing rate, then the marginal utility declines with increase in consumption. When total utility reaches its maximum point, then the marginal utility is equal to zero. This is because after the point any additional unit consumed would lead to a fall in total utility.

The declining slope of the Marginal Utility curve reflects the law of diminishing marginal utility which states that the more of a given commodity consumed, the less the addition to total utility. This diminishing marginal utility is a reflection of law of demand as it shows that more of a commodity will be bought at a lower price than at a higher price.

SAQ 4.2

An indifference curve shows all combinations of commodities that yield the same level of satisfaction to the household. A household is indifferent between the combinations indicated by any two points on one indifference curve. An indifference curve is a graph showing different bundles of goods between which a consumer is indifferent. That is, at each point on the curve, the consumer has no preference for one bundle over another. One can equivalently refer to each point on the indifference

curve as rendering the same level of utility (satisfaction) for the consumer. In other words an indifference curve is the locus of various points showing different combinations of two goods providing equal utility to the consumer. Utility is then a device to represent preferences rather than something from which preferences come. The main use of indifference curves is in the representation of potentially observable demand patterns for individual consumers over commodity bundles.

There are infinitely many indifference curves: one passes through each combination. A collection of (selected) indifference curves, illustrated graphically, is referred to as an indifference map.

Features of an indifference curve

- It is convex to the origin
- It is downward sloping
- It operates under the principle of diminishing marginal rate of substitution
- Two indifference curve can never intersect

SAQ 5.1

Firms: can be defined as economic agent whose motive in business is to maximize profit. This assumption is useful because it helps us to understand and also predict the behaviour of the firms under different situations.

Factors of production: These are human and natural resources that aid productive activities in an economy. They are land, labour, capital, and entrepreneur.

Cost: It can be defined as the amount in terms of human and material resources expended in production processes. This is an accountant definition of cost. The economists, however, view cost as the opportunity cost i.e benefits forgone by not using it in an alternative use.

SAQ 5.2

An exception to the law of supply has been found in the backward bending supply curve. This is based on the postulate that although an individual will normally be willing to offer more hours of work, with increasing wage rate, a point will be reached where any additional increase in wage rate will lead to a desire for more leisure and therefore a decrease in the number of hours offered for work.

SAQ 5.3

Short run: It is a planning period whereby firm cannot vary all its production inputs. Since at the least an input is fixed, a firm can only increase production by increasing variable inputs.

Long run: This is a planning horizon whereby all factors of production are variable. In the long run, firm can change its fixed input easily and expand its line of operations as it deem fit.

Very long run: It is concerned with situations in which the technological possibilities open to the firm are subject to change, leading to new and improved products and new methods of production.

SAQ 6.1

Production functions: This can be defined as a technical relationship between input and output. It is a graphical or mathematical expression showing the relationship between the inputs used in production and the output achieved. The relationship between the inputs and the resulting output is described as production function in Economics. According to Prof. George Stigler, "it's the summary of economist technical

knowledge". E.g $q = f(L, \bar{K})$, where q is the output produced, L and K are the inputs combined together to produce q . A common example of production function is a Cobb Douglass production function.

Production processes: It is a systematic way of combining inputs as well as methods adopted in production. Process production involves a series of processes which inputs go through. The end result is a large quantity of finished product or output.

Point of diminishing average productivity: In a production process, the point at which average product is the highest is known as the point of diminishing average productivity.

Diminishing returns: The law of diminishing returns states that "if increasing quantities of a variable factor are applied to given fixed factors, the marginal product and the average product of the variable factor will eventually decrease".

SAQ 7.1

Theory of firm behaviour hinges on the assumption that firm seeks to maximize profits by minimizing the cost of production. All firm irrespective of size and market structure exhibit such behaviour. The theory of the firm goes along with the theory of the consumer, which states that consumers seek to maximize their overall utility. Modern economist takes on the theory of the firm sometimes distinguish between long-run motivations (sustainability) and short-run motivations (profit maximization).

SAQ 7.2

- (a) Fixed Cost.
- (b) The firm paid the N10000 for three months, this will amount to N30,000. If add this together with the salaries of workers which amount to N200,000 we have N230,000. So, the total fixed cost incurred by the firm is:
Total Fixed Cost= N30000+N200000

$$=N230,000$$

SAQ 8.1

Total revenue = N200

Average revenue= Total revenue/Quantity produced= 200/100=N2

Marginal revenue= Additional revenue/additional quantity

$$=(N220-N200)/(110-100)$$

$$=N20/10$$

$$=N2.$$

SAQ 8.2

The three basic rules for profit maximization are:

- A rule to decide whether to produce or not to produce.
- A rule to ensure that profit is either at a maximum or at a minimum.
- A rule to ensure that profit is maximized rather than minimized.

SAQ 9.1

1. Not perfectly competitive—There are few sellers in this market (Fedex, UPS, and the Nigerian Postal Services are the main ones in the Nigeria) probably because of the difficulty of entry and exit. To provide these services requires many outlets and a large transportation fleet, for example.
2. Perfectly competitive—there are many firms producing a largely homogeneous product and there is good information about prices. Entry and exit is also fairly easy as firms can switch among a variety of crops.
3. Not perfectly competitive—the main reason is that goods are not identical.

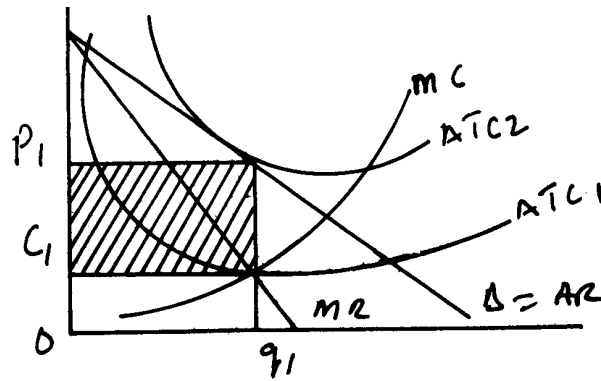
SAQ 10.1

Monopolist

- A single producer producing product(s) without perfect substitutes
- A monopolist has market power over price and output but cannot determine both simultaneously

SAQ 10.2

A monopolist attains equilibrium at a point where marginal cost equals marginal revenue. This is the output maximization condition. The equilibrium output and price are q_1 and P_1 . This equilibrium meets the several conditions for profit maximizing behaviour. Since monopoly is faced with a downward sloping demand curve with marginal revenue always less than average revenue, he makes abnormal profit both in the short run and long run.



SAQ 10.3

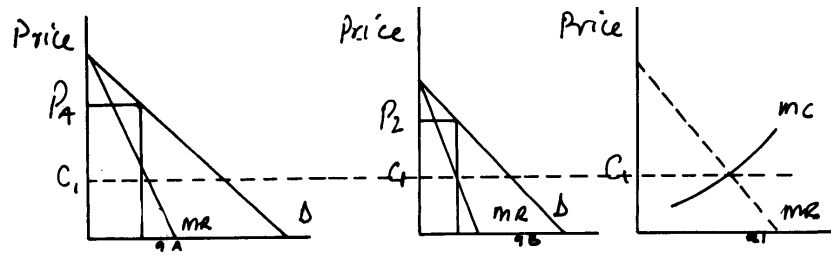
This producer has features of a monopolist.

Reasons for the Existence of Monopolies

1. **Patent Laws:** Patent laws may create and perpetuate monopolies by conferring on the patent holder the sole right to produce a particular commodity. The government may grant a firm a charter or a franchise that prohibits competition by law.
2. **Economies of scale:** Monopolies may also rise because of economies of scale. The established firm may retain a monopoly through a cost advantage because it can produce at a lower cost than could any new and necessarily smaller competitors.
3. **Access to Raw Materials:** In a situation where one firm has the sole access to the raw material used for producing a commodity, other firms may not be able to enter into the industry.
4. A monopoly may also be perpetuated by force: Potential competitors can be intimidated by threats ranging from sabotage to a price war which the established monopoly has sufficient financial resources to win.

SAQ 10.4

- A. Ordinary monopoly charges the same price for single product to its customers; while discriminating monopoly charges different price for single product to its customers.
- B. The marginal cost of producing another unit for sale in market A will depend on how much is being produced for sale in market B and vice-versa. To determine what overall production should be, we need to know the overall marginal revenue, to find this we merely sum the separate quantities in each market that corresponds to each marginal revenue. The firm's total profit maximizing output is at Q_1 where MR^1 and MC^1 intersect at a value C_1 , the firm will allocate sales between the markets until the marginal revenue of the last unit sold in each market are the same.



SAQ 11.1

- Existence of large number of buyers and sellers
- Homogenous but non-identical commodities in the market
- The firm faces a downward sloping demand curve
- Huge expenses in advertisement

SAQ 11.2

Since the demand curve faced by an oligopolistic firm is kinked in nature, the marginal revenue is discontinuous at some point. Therefore, the firm will produce at a point where its short run marginal cost equals its short run average cost.

SAQ 12.1

Factors that influence the demand for factors of production

- The Quantity or Factor Demanded in Equilibrium

Factors that influencing the supply of factors of production

- Labour
- Land
- Capital

SAQ 12.2

The determination of wages without unions

- When labour is supplied and demanded competitively
- When labour is supplied competitively and demanded monopolistically.

The determination of wages with unions

- When Labour is supplied monopolistically but Purchased Competitively
- When Labour is Supplied monopolistically and demanded monopolistically.

SAQ 12.3

- The level of education and experience
- Demand and supply conditions
- The risk associated with the job
- The skills involved

- Differences in stability of employment
- The social prestige associated with different occupation.

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