# CC201
# Introduction to Microconomics

## Self-Learning Course Manual

Version 1.1

Centre for Distance Learning
MAUTECH
Yola, Adamawa

EDUTECH PORTAL Solutions

COURSE MANUAL

# Introduction to Microeconomics

## CC201

Modibbo Adama University of Technology
Open and Distance Learning Course Development Series

Instructional design & development by

Solutions
EDUTECHPORTAL
www.edutechportal.org

**Institution**:
**Centre for Distance Learning,**
**Modibbo Adamawa University of Technology,**
**Yola, Adamawa State, Nigeria**
Tel: +234(8035617757)
E-mail: mail@cdl.mautech.edu.ng
Website: www.cdl.mautech.edu.ng

# Course Development Team

The Academic Collective wishes to thank those below for their contribution to the Special Edition of this Course Manual (Modibbo Adama University of Technology).

Prof. Abdullahi Liman Tukur
**EDITOR-IN-CHIEF**

Prof. Francis Egbokhare
**Consulting Editor**

Folajimi Olambo Fakoya
**Production Editor & Learning Technologist**

Dr Manu Donga
**Content Editor**

Dr. Noah Olaseinde
**Contributory Writer**

Libby Rittenberg and Tim Tregarthen
**Content Attributions**

Oluwafemi Falode
**Adaptation & Instructional Designer**

Moriatu Vivien Bello-Osagie
**Language Editor**

# Credits

All illustrations (photos and charts) used are sourced from www.edutechportal.org/resources except otherwise indicated. We therefore sincerely wish to acknowledge sources of the following images (in order of appearance):

| | |
|---|---|
| Mambila Plateau | www.mynewswatchtimesng.com |

# Contents

# About this Course Manual

Introduction to Microeconomics CC201 is provided to you by MAUTECH-CDL, AS IS. Module is mixed, and some selected modules are attributed to Libby Rittenberg and Tim Tregarthen. It is localised and adapted to ODL format under the Academic Collective.

## How this Course Manual is structured

### 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 can expect from the course.
- How much time you will need to invest to complete the course.
- Where to get help.
- Course assessments.

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.
- Study Session preview.
- New terminology.
- Structured content of the study session with a variety of focus articles, learning activities and learning devices.
- A Study Session review.
- Self-Assessments.
- Resources for further studying.

# Your comments

After completing Introduction to Microeconomics 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 duration.

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

# Course overview

## Welcome to Introduction to Microeconomics CC201

This course is designed to help you build an understanding of the economics of the market place. Focus is on microeconomic principles that demonstrate the role and limitations of both competitive and imperfectly competitive markets in motivating socially efficient consumer, business, and public sector choices.

This course manual supplements and complements a blend of resources & platforms:

**CC201 Audiobook –** available via Audio Resources Library app on your official mobile device and accessible online at: www.arlibrary.cdl.mautech.edu.ng.

**CC201 Courseware –** available in your course pack as a disk, it is also downloadable from your course website: www.cdl.mautech.edu.ng/schoolboard.

**Schoolboard –**offers a multi-channel platform for you to discuss with content experts and other learners from across the nation and the globe at large. You may also use the platform to enrich your learning with engaging webinars, articulate presentations, smart puzzles, audiobooks, podcasts, interactive glossaries, smart quizzes, case studies and discussions. Schoolboard comes with updates and is accessible on web and on app. It is also linkable from your course CD.

## Introduction to Microeconomics CC201—is this course for you?

This course is for you if you are willing to learn ways to think about how humans allocate resources, determine prices. You capture in this course: consumer and producer behaviour, how market works, risk and cost measurement. Use this knowledge for further study in economics, or apply it to your everyday business dealings to make more effective decisions.

You will need comprehension and arithmetic skills for this course.

- CC101 is a prerequisite to this course.
- CC201 is a 2 unit course, and a requirement for CC301.

# Course outcomes

Outcomes

Upon completion of Introduction to Microeconomics CC201, you will be able to:

- *fluent* in the concepts of microeconomics
- *present* how consumers and producers interact in the marketplace
- *point out* how demand and supply jointly determine market prices in equilibrium
- *show* how government policies affect markets
- *estimate* the government revenue raised by taxes, and the costs these fees place on society
- explain the effects of government in remedying various market failures
- describe how firms make decisions in the short, and long-run, and how to measure profits and quantities of goods produced

# Study Skills

Being a self-learner has become increasingly feasible due to Open and Distance Learning (ODL) Systems. Studying a course or obtaining a certificate for career advancement can occur from the comfort of your home, on your own time, and at your own pace.

You can be a successful higher education student by self learning, it isn't magic! But it does require desire, dedication and a lot of work. Active listening to your audiobook, desktop publishing on your laptops, reading comprehension in your course manual, notetaking in the white margins, stress management, time management, assessment taking, and memorization are study skills required for a self learner.

If you really want to learn how to become a successful student, then you should explore the links that follow:

- http://www.oercommons.org/courses/communication-skills-study-skills-pdf/view
- http://www.edutechportal.org/resources/studyskills/

# Timeframe

This is a 15 week course. It requires a formal study time of 12 hours. We recommend you take an average of one to two hours for an extra personal study on each Study Session. You can also benefit from online discussions with your course tutor.

# Need help?

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

CDL Student Support Desk
Tel: (+234) 703 355 2537
Email: support@cdl.mautech.edu.ng

For technical issues (computer problems, web access, and etcetera), please visit: www.cdl.mautech.edu.ng/support; or send mail to support@cdl.mautech.edu.ng.

# Academic Support

A course facilitator is commissioned for this course. You have also been assigned an academic tutor to provide learning support. See contacts of your course facilitator and academic advisor at the course website: www.cdl.mautech.edu.ng/schoolboard

# Assessments

Generally, there are two types of assessment: formative assessment and summative assessment. With regards to your formative assessment, there are three basic forms of assessment in the course: in-text questions (SELF-CHECKs), self-assessment questions (SAQs), and tutor marked assessment (TMAs). This manual provides you with SELF-CHECKs and SAQs. Feedbacks to the SELF-CHECKs are placed immediately after the questions, while the feedbacks to SAQs are at the rear of manual.

You will receive your TMAs as assignments at the MAUTECH schoolboard platform. These assignments will constitute 30 percent of your course marks. Feedbacks to TMAs will be provided by your tutor in not more than 2 weeks after entries.

Your summative assessment is your final examination. CC201 exam is in multiple choice / essay format; and it carries 70 percent of your total earning in the course.

Schedule dates for submitting assignments and engaging in course activities is available on the course website.

# List of Figures

# List of Tables

# Study Session 1

# Basic Issues in Economics

Figure 1.1 Nigerian currency – Naira (cc-edutechportal.org/resource)

## INTRODUCTION

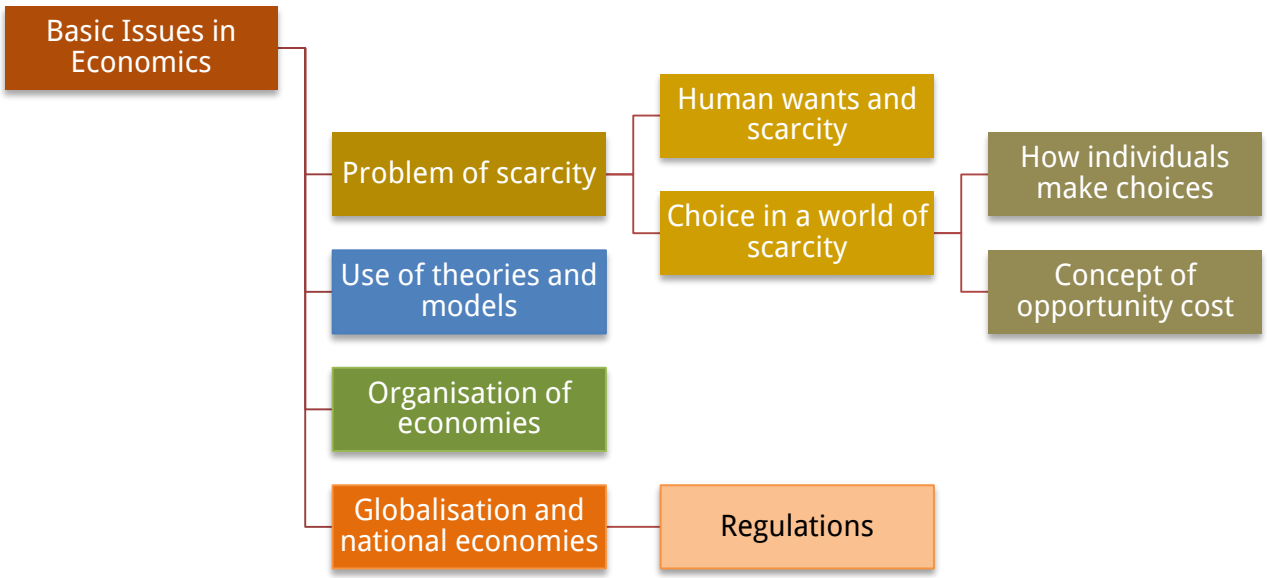
Is your entire money able to buy all you want? Is your time (24 hours per day) sufficient for you to do everything you wanted? Do you say no, that they aren't sufficient? Yes, resources to do everything is scare. Scarcity is the central theme of economics. We will therefore commence our study in this course with a discussion on the problem of scarcity. We will also examine division of labour, trades and markets, and use of theory in economics.

### Learning Outcomes

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

1.1 *explain* the problem of scarcity
1.2 *use* economic theory and model
1.3 *differentiate* between traditional, command and market economy

## Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| Economics | The branch of knowledge concerned with the production, consumption, and transfer of wealth. |
| Scarcity | The state of being scarce or in short supply; shortage. |
| Theory | A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained. |
| Model | A thing used as an example to follow or imitate. |
| Globalization | The process by which businesses or other organizations develop international influence or start operating on an international scale. |

# 1.1 THE PROBLEM OF SCARCITY

## 1.1.1 HUMAN WANTS AND SCARCITY

**Economics** is the study of how humans make decisions regarding their wants in the face of scarcity. Human wants for goods, services and resources exceed what is available.

Resources, such as labour, tools, land, and raw materials are necessary to produce the goods and services we want but they exist in limited supply. For instance, a scarce resource is time- everyone, rich or poor, has just 24 hours in the day to try to acquire the goods they want. At any point in time, there is only a finite amount of resources available. Also, there are so many crucial but limited resource. Because these resources are limited, so are the numbers of goods and services we produce with them. Combine this with the fact that human wants seem to be virtually infinite, and you can see why **scarcity** is a problem. Thus, it becomes imperative, that there are individual decisions, family decisions, business decisions or societal decisions concerning the choice / use of scarce resources.

If you still do not believe that scarcity is a problem, consider the following: Does everyone need food to eat? Does everyone need a decent place to live? Does everyone have access to healthcare? In every country in the world, there are people who are hungry, homeless and in need of healthcare, just to focus on a few critical goods and services. Why is this the case? It is because of scarcity. Let's delve into the concept of scarcity a little deeper, because it is crucial to understanding economics.


Figure 1.2 Street children sleeping on a street in Addis Ababa, Ethiopia 2007

Think about all the things you consume: food, shelter, clothing, transportation, healthcare, and entertainment. How do you acquire those items? You do not produce them yourself. You buy them. How do you afford the things you buy? You work for pay. Or if you do not, someone else does on your behalf. Yet most of us never have enough to buy all the things we want. This is because of scarcity. So how do we solve it?

Every society, at every level, must make choices about how to use its resources. Families must decide whether to spend their money on a new car or a fancy vacation. Towns must choose whether to put more of the budget into police and fire protection or into the school system. Nations must decide whether to devote more funds to national defence or to protecting the environment. In most cases, there just isn't enough money in the budget to do everything. So why do we not each just produce all of the things we consume? The simple answer is most of us do not know how, but that is not the main reason. (When you study economics, you will discover that the obvious choice is not always the right

**Economics**

A science that studies how human make choices when confronted with scarcity.

**Scarcity**

The basic economic problem, the gap between limited resources and theoretically limitless wants.

answer—or at least the complete answer. Studying economics teaches you to think in a different of way.) Think back to pioneer days, when individuals knew how to do so much more than we do today, from building their homes, to growing their crops, to hunting for food, to repairing their equipment. Most of us do not know how to do all—or any—of those things. It is not because we could not learn. Rather, we do not have to. The reason why something is called the division and specialization of labour, a production innovation first put forth by Adam Smith.

**Smart check**

**Question**

- The study of how humans make decision regarding their wants in the face of scarcity is called _____.

**Feedback**

- Did you supply "economics" to fill the gap? Yes! Economics is the study of how individuals and societies choose to use the scarce resources that nature and previous generations have bestowed on them.

## 1.1.2 Choice in a World of Scarcity

You will learn quickly when you examine the relationship between economics and scarcity that choices involve tradeoffs. Every **choice** has a **cost**.

English economist Lionel Robbins (1898–1984), in his Essay on the Nature and Significance of Economic Science in 1932, described not always getting what you want in this way:

> *The time at our disposal is limited. There are only twenty-four hours in the day. We have to choose between the different uses to which they may be put. ... Everywhere we turn, if we choose one thing we must relinquish others which, in different circumstances, we would wish not to have relinquished.*

Scarcity of means to satisfy given ends is an almost ubiquitous condition of human nature. Because people live in a world of scarcity, they cannot have all the time, money, possessions, and experiences they wish. Neither can society.

**Choice**

Alternative selected over another.

**Cost**

The option or the amount that is given up for another thing.

### How Individuals Make Choices Based on Their Budget Constraint

Consider the typical consumer's budget problem. Consumers have a limited amount of income to spend on the things they need and want. Suppose Danladi has ₦1000 in spending money each week that he can allocate between bus tickets for getting to work and the meal that he eats for lunch. Meal cost ₦200 each, and bus tickets are ₦50 each. Figure 1.3 shows Danladi's budget constraint, that is, the outer boundary of his opportunity set. The opportunity set identifies all the opportunities for spending within

his budget. The budget constraint indicates all the combinations of meals and bus tickets Danladi can afford when he exhausts his budget, given the prices of the two goods.

Budget – ₦1000 Meal – ₦200 Bus tickets – ₦50

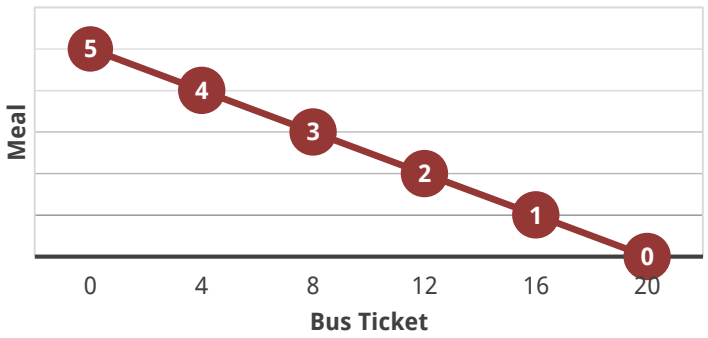



**Figure 1.3 The Budget Constraint:** Danladi's Consumption Choice Opportunity Frontier Each point on the budget constraint represents a combination of meals and bus tickets whose total cost adds up to Danladi's budget of ₦1000. The slope of the budget constraint is determined by the relative price of meals and bus tickets. All along the budget set, giving up one meal means gaining four bus tickets.

The vertical axis in the figure shows meal purchases and the horizontal axis shows bus ticket purchases. If Danladi spends all his money on meal, he can afford five per week. (₦1000 per week/₦200 per meal = 5 meals per week.) But if he does this, he will not be able to afford any bus tickets. This choice (zero bus tickets and five meals) is shown by point A in the figure. Alternatively, if Danladi spends all his money on bus tickets, he can afford 20 per week. (₦1000 per week/₦50 per bus ticket = 20 bus tickets per week.) Then, however, he will not be able to afford any meals. This alternative choice (20 bus tickets and zero meals) is shown by point F.

If Danladi is like most people, he will choose some combination that includes both bus tickets and meals. That is, he will choose some combination on the budget constraint that connects points A and F. Every point on (or inside) the constraint shows a combination of meals and bus tickets that Danladi can afford. Any point outside the constraint is not affordable, because it would cost more money than Danladi has in his budget.

The budget constraint clearly shows the tradeoff Danladi faces in choosing between meals and bus tickets. Suppose he is currently at point D, where he can afford 12 bus tickets and two meals. What would it cost Danladi for one more meal? It would be natural to answer ₦200, but that's not the way economists think. Instead they ask, how many bus tickets would Danladi have to give up to get one more meal, while staying within his budget? The answer is four bus tickets. That is the true cost to Danladi of one more meal.

**Link it up**

See Appendix 1.1, linked here on how to construct Budget Constraint Graph

### The Concept of Opportunity Cost

Economists use the term opportunity cost to indicate *what must be given up to obtain something that is desired*.

**Note it down**

The idea behind opportunity cost is that the cost of one item is the lost opportunity to do or consume something else; in short, opportunity cost is the value of the next best alternative. For Danladi, the opportunity cost of a meal is the four bus tickets he would have to give up. He would decide whether or not to choose the meal depending on whether the value of the meal exceeds the value of the forgone alternative—in this case, bus tickets. Since people must choose, they inevitably face tradeoffs in which they have to give up things they desire to get other things they desire more.

## 1.2 USE OF THEORIES AND MODELS TO UNDERSTAND ECONOMIC ISSUES

Economists see the world through a different lens than anthropologists, biologists, classicists, or practitioners of any other discipline. They analyse issues and problems with economic theories that are based on particular assumptions about human behaviour that are different than the assumptions an anthropologist or psychologist might use. A **theory** is a simplified representation of how two or more variables interact with each other. The purpose of a theory is to take a complex, real-world issue and simplify it down to its essentials. If done well, this enables the analyst to understand the issue and any problems around it. A good theory is simple enough to be understood, while complex enough to capture the key features of the object or situation being studied. Sometimes economists use the term **model** instead of theory. Strictly speaking,

*a theory is a more abstract representation, while a model is more applied or empirical representation. Models are used to test theories, but for this course we will use the terms interchangeably.*

**Theory**

A set of assumptions or accepted facts that is used to provide a rational explanation of cause-and-effect relationships among a group of observed phenomenon.

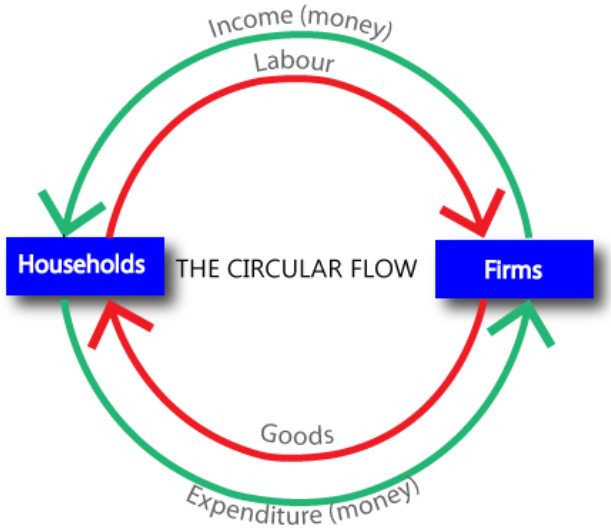
**Model**

A simplified description of reality, designed to yield hypotheses about economic behavior that can be tested.

A good model to start with in economics is the circular flow diagram, which is shown in Figure 1.4. It pictures the economy as consisting of two groups—households and firms—that interact in two markets: the goods and services market in which firms sell and households buy and the labour market in which households sell labour to business firms or other employees.

**Figure 1.4 Circular flow diagram**

A model of the economy in which the major exchanges are represented as flows of money, goods and services, etc. between economic agents.




The circular flow diagram shows how households and firms interact in the goods and services market, and in the labour market. The direction of the arrows shows that in the goods and services market, households receive goods and services and pay firms for them. In the labour market, households provide labour and receive payment from firms through wages, salaries, and benefits. Of course, in the real world, there are many different markets for goods and services and markets for many different types of labour. The circular flow diagram simplifies this to make the picture easier to grasp. In the diagram, firms produce goods and services, which they sell to households in return for revenues.

This is shown in the outer circle, and represents the two sides of the product market (for example, the market for goods and services) in which households demand and firms supply. Households sell their labour as workers to firms in return for wages, salaries and benefits. This is shown in the inner circle and represents the two sides of the labour market in which households supply and firms demand.

## Smart check

**Question**

- _____ is a simplified representation of how two or more variables interact with each other. (a) Theory (b) Model

**Feedback**

- The correct answer is (a). A simplified representation of how two or more variables interact with each other is called theory.

This version of the circular flow model is stripped down to the essentials, but it has enough features to explain how the product and labour markets work in the economy. We could easily add details to this basic model if we wanted to introduce more real-world elements, like financial markets, governments, and interactions with the rest of the globe (imports and exports). Economists carry a set of theories in their heads like a carpenter carries around a toolkit. When they see an economic issue or problem, they go through the theo6ries they know to see if they can find one that fits. Then they use the theory to

derive insights about the issue or problem. In economics, theories are expressed as diagrams, graphs, or even as mathematical equations. Economists do not figure out the answer to the problem first and then draw the graph to illustrate. Rather, they use the graph of the theory to help them figure out the answer. Although at the introductory level, you can sometimes figure out the right answer without applying a model, if you keep studying economics, before too long you will run into issues and problems that you will need to graph to solve. Both micro and macroeconomics are explained in terms of theories and models. The most well-known theories are probably those of supply and demand, but you will learn a number of others.

# 1.3 HOW ECONOMIES CAN BE ORGANIZED

Think about what a complex system a modern economy is. It includes all production of goods and services, all buying and selling, all employment. The economic life of every individual is interrelated, at least to a small extent, with the economic lives of thousands or even millions of other individuals. Who organizes and coordinates this system? Who insures that, for example, the number of televisions a society provides is the same as the amount it needs and wants? Who insures that the right number of employees work in the electronics industry? Who insures that televisions are produced in the best way possible? How does it all get done? There are at least three ways societies have found to organize an economy.

## 1.3.1 TRADITIONAL ECONOMY

The first is the **traditional economy**, which is the oldest economic system and can be found in parts of Asia, Africa, and South America. Traditional economies organize their economic affairs the way they have always done (i.e., tradition). Occupations stay in the family. Most families are farmers who grow the crops they have always grown using traditional methods. What you produce is what you get to consume. Because things are driven by tradition, there is little economic progress or development.

## 1.3.2 Command Economy

**Traditional economy**

An economic system in which traditions, customs, and beliefs shape the goods and the services the economy produces, as well as the rules and manner of their distribution.

**Command economy**

An economic structure where the government determines what goods should be produced, how much should be produced and the price at which the goods will be offered for sale.

**Market economy**

An economy in which decisions regarding investment, production, and distribution are based on market determined supply and demand, and prices of goods and services are determined in a free price system.

**Command economies** are very different. In a command economy, economic effort is devoted to goals passed down from a ruler or ruling class. Ancient Egypt was a good example: a large part of economic life was devoted to building pyramids. Medieval manor life is another example: the lord provided the land for growing crops and protection in the event of war. In return, vassals provided labour and soldiers to do the lord's bidding. In the last century, communism emphasized command economies. In a command economy, the government decides what goods and services will be produced and what prices will be charged for them. The government decides what methods of production will be used and how much workers will be paid. Many necessities like healthcare and education are provided for free. Currently, Cuba and North Korea have command economies.

## 1.3.3 Market Economy

Although command economies have a very centralized structure for economic decisions, **market economies** have a much decentralized structure. A market is an institution that brings together buyers and sellers of goods or services, who may be either individuals or businesses. In a market economy, decision making is decentralized. Market economies are based on private enterprise: the means of production (resources and businesses) are owned and operated by private individuals or groups of private individuals. Businesses supply goods and services based on demand. (In a command economy, by contrast, resources and businesses are owned by the government.) What goods and services are supplied depends on what is demanded. A person's income is based on his or her ability to convert resources (especially labour) into something that society values. The more society values the person's output, the higher the income. Most economies in the real world are mixed; they combine elements of command and market (and even traditional) systems.

While primarily market-oriented economies have a greater degree of government involvement in economic decisions than does the U.S. economy. China and Russia, while they are closer to having a market-oriented system now than several decades ago, remain closer to the command economy end of the spectrum.

### Smart check

**Question**

- Fill the table with appropriate option from the following list:
  Traditional Economy, Command Economy, Market Economy

| | |
|---|---|
| I | decision making is decentralized |
| II | economic effort is devoted to goals passed down from a ruler or ruling class |

**Feedback**

I. Market economy
II. Command economy

# GLOBALISATION AND NATIONAL ECONOMIES

**Globalisation**

The process by which businesses or other organizations develop international influence or start operating on an international scale.

Recent decades have seen a trend toward **globalisation**, which is the expanding cultural, political, and economic connections between people around the world. One measure of this is the increased buying and selling of goods, services, and assets across national borders—in other words, international trade and financial capital flows. Globalization has occurred for a number of reasons. Improvements in shipping and air cargo have driven down transportation costs. Innovations in computing and telecommunications have made it easier and cheaper to manage long-distance economic connections of production and sales. Many valuable products and services in the modern economy can take the form of information—for example: computer software; financial advice; travel planning; music, books and movies. These products and many others can be transported over telephones and computer networks at ever-lower costs. Finally, international agreements and treaties between countries have encouraged greater trade.

Table 1.1 presents one measure of globalization. It shows the percentage of domestic economic production that was exported for a selection of countries from 2010 to 2013, according to an entity known as The World Bank. **Exports** are the goods and services that are produced domestically and sold abroad. **Imports** are the goods and services that are produced abroad and then sold domestically. The size of total production in an economy is measured by the gross domestic product (GDP). Thus, the ratio of exports divided by GDP measures what share of a country's total economic production is sold in other countries. Smaller economies like Nigeria, Ghana, and some other African countries need to trade across their borders with other countries to take full advantage of division of labour, specialization, and economies of scale.

Table 1.1 Extent of globalization (Exports/GDP)

| Country | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|
| **Higher Income Countries** | | | | |
| United States | 12.4 | 13.6 | 13.6 | 13.5 |
| Belgium | 76.2 | 81.4 | 82.2 | 82.8 |
| Canada | 29.1 | 30.7 | 30.0 | 30.1 |
| France | 26.0 | 27.8 | 28.1 | 28.3 |
| **Middle Income Countries** | | | | |
| Brazil | 10.9 | 11.9 | 12.6 | 12.6 |
| Mexico | 29.9 | 31.2 | 32.6 | 31.7 |
| South Korea | 49.4 | 55.7 | 56.3 | 53.9 |
| **Lower Income Countries** | | | | |
| Chad | 36.8 | 38.9 | 36.9 | 32.2 |
| China | 29.4 | 28.5 | 27.3 | 26.4 |
| India | 22.0 | 23.9 | 24.0 | 24.8 |
| Nigeria | 25.3 | 31.3 | 31.4 | 18.0 |

(Source: http://databank.worldbank.org/data/)

Table 1.1 also shows that many medium and low income countries around the world, like Mexico and China, have also experienced a surge of globalization in recent decades.

## Regulations: The Rules of the Game

Markets and government regulations are always entangled. There is no such thing as an absolutely free market. Regulations always define the "rules of the game" in the economy. Let's take a practical view in the focus that follows.

# Focus: The Way to Provide Fuel for the Economy – Regulation or Deregulation?


Figure 1.4 Fuelling station, Total Nigeria

Nigerian federal government regulates her petroleum sector. This government's stranglehold on the oil and gas sector is taking a continuing toll on the economy, with companies in the downstream sector seeing a hit to their revenues.

The major players which include Total Nigeria Plc, Mobil Nigeria Plc, MRS Nigeria Plc and Forte Oil Nigeria Plc had their cumulative revenue falling by 19.16 percent to N608.58 billion, according to data compiled by BusinessDay from their latest 2015 financials. The firm's cumulative net profits were down 7.40 percent to N15.655 billion from N16.90 billion in 2014.

Experts say government should free itself from the sector as its policies tend to impoverish the masses it claims to be protecting. Analysts say these firms have been consistently hard hit by delays in subsidy payment which result in shortage in petroleum products and supply.

Indeed 2015 was a watershed for these oil marketers as the cash strapped Nigerian government owed them arrears as much as $1 billion, a situation that sparked disputes which resulted in strike actions; and also caused fuel scarcity which brought the economy to its knees. While the government had saved N1 trillion since January 2016 because it has not paid subsidy on petrol, the non-availability of foreign exchange to sustain the importation of products has caused the longest period of hard hit scarcity, pushing the pump price from official 86.50 to 250.00. Nigeria is struggling to cope with a plunge in crude oil prices which averagely accounted for about two-thirds of government revenue. The uncertainty has forced the apex bank to impose capital controls such as restricting the

amounts of dollars it sells to manufacturers. The policy however is causing manufacturers pain as they cannot access dollars to pay for imports.

Experts say the only way out of the tedious queues caused by fuel scarcity is to allow oil marketers access to foreign exchange. "The government needs to create an enabling environment for sufficient FX provisioning for the marketers in the meantime, so as to allow for adequate import by the marketers, especially given the increase in Q2:2016 import allocation to 58% as against the 22% allocation issued to the marketers in Q1:2016.," said Saheed Bashir, head investment and research Meristem securities in an email response to questions.

Curled from: http://www.financialwatchngr.com/2016/04/18/oil-sector-regulation-crimps-oil-marketers-revenues/

## Reflection

Economies that are primarily market-oriented have fewer regulations — ideally just enough to maintain an even playing field for participants. Conversely, even the most command-oriented economies operate using markets. Or how else would buying and selling occur? But the decisions of what will be produced and what prices will be charged are heavily regulated. Heavily regulated economies often have underground economies, which are markets where the buyers and sellers make transactions without the government's approval. The question of how to organize economic institutions typically involves a balancing act over the appropriate combination of market freedom and government rules.

Balancing the level of regulation leads to mixed economy. Mixed economy in Nigeria consists of both private companies and government owned entities. Both have control of owing, making, selling, and exchanging goods in the country. The major characteristic of mixed economy is the ownership of goods by both private and government owned entities

# Session Review

### 1.1 Explain the problem of scarcity

Scarcity means that people want more than is available. Scarcity limits us both as individuals and as a society. As individuals, limited income (and time and ability) keep us from doing and having all that we might like. As a society, limited resources (such as manpower, machinery, and natural resources) fix a maximum on the amount of goods and services that can be produced.

Scarcity requires choice. People must choose which of their desires they will satisfy and which they will leave unsatisfied. When we, either as individuals or as a society, choose more of something, scarcity forces us to take less of something else.

### 1.2 Use economic theory and model

The main tools economists use are economic theories or models. A theory is not an illustration of the answer to a problem. Rather, a theory is a tool for determining the answer, and model is a framework.

### 1.3 Differentiate between traditional, command and market economy

Societies can be organized as traditional, command, or market-oriented economies. Most societies are a mix. Notably, globalization evolve as a result of growth in commercial and financial networks that cross national borders, making businesses and workers from

When there is scarcity and choice, there are costs. The cost of any choice is the option or options that a person gives up.

different economies increasingly interdependent.

### Key terms that I've discovered

Economics, p.10
Scarcity, p.10
Choice, p.11
Theories, p.14
Models, p.14
Globalisation, p.16
Traditional economy, p.15
Command economy, p.15
Market economy, p.16

# Assessment

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

After you gained admission, your parents and, probably, your extended family members would have asked you to make a list of what you will require in school. When you did so, were they able to provide everything you wrote? Even if they wished to, the resources needed, in terms of cash or otherwise, might not be readily available, what economics term best describes this shortage in means of providing your request?

**SAQ 1.2 (tests Learning Outcome 1.2)**

Assuming after school, Useni and Okon decides to work on yam plantation in order to have extra income. However, whenever they get to the farm, they will both dig the ground and pull the yams out together. At the end of each day, they were able to harvest 50 tubers of yams and they were very happy with their achievements. One day, an elderly man advised them to separate their work. He advised Useni to be digging the ground while Okon should be pulling out the yams. After applying the old man's method, they were surprised to record a harvest of 200 tubers of yam. What would you as an economist call the old man's method? Give reasons for your answer.

**SAQ 1.3 (tests Learning Outcome 1.3)**

There are basically three ways of organizing the economy of any country. First is traditional economy which is how people organize the economy in the olden days. The second is the command economy where the government makes all the decisions in the market. In your own work, describe the third way of organizing the economy.

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 2

# Demand and Supply (Goods and Services)

@CRM-Supermarket (cc_courstesy edutechportal.org/resource) | How many bottles of drinks can you buy for your next birthday? And how much really, are the producers of these drinks (i.e. goods) willing to bring to the market and at what price?

## INTRODUCTION

In this study session, you will explore the issues surrounding demand and supply of goods and services. You will also come across what economist refers to as ceteris paribus, which means "all things being equal".

### Learning Outcomes

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

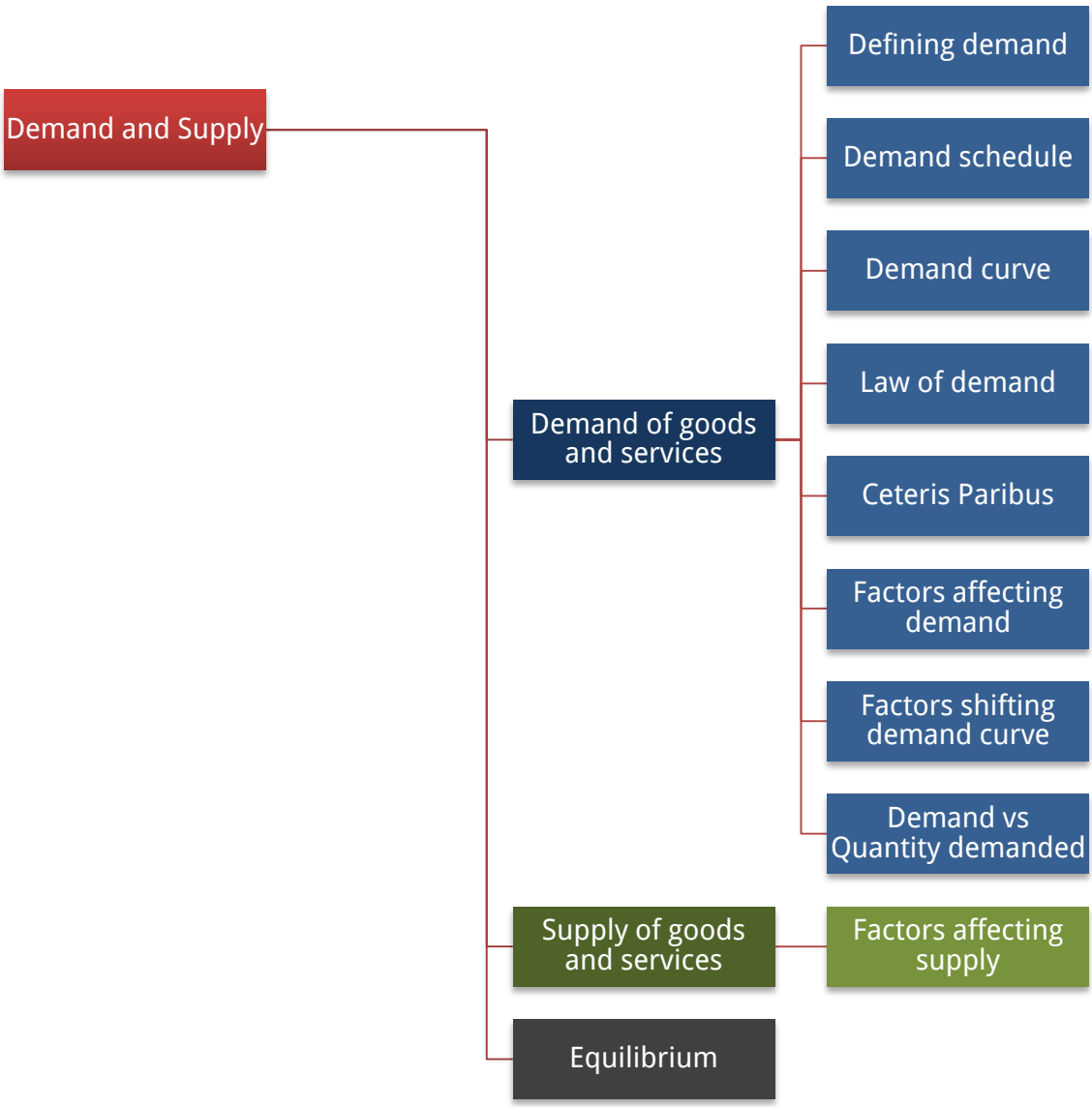
2.1 *define* and *use correctly* the terms in bold:

- **demand schedule**
- **demand curve**
- **changes in demand**

2.2 *analyse* supply, supply curve and changes in supply

2.3 *point out* equilibrium point

## Session Preview




## Study Session Duration

This Study Session requires a two hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| **Demand** | Consumer's desire and willingness to pay a price for a specific good or service |
| **Demand schedule** | A table that lists the quantity of a good all consumers in a market will buy at every different price. |

| | |
|---|---|
| **Demand curve** | A graph showing how the demand for a commodity or service varies with changes in its price. |
| **Supply** | Describes the total amount of a specific good or service that is available to consumers. |
| **Supply schedule** | A tabular depiction of the relationship between price and quantity supplied, represented graphically as a supply curve. |
| **Supply curve** | A graphical representation of the relationship between the price of a good or service and the quantity supplied for a given period of time. |
| **Equilibrium** | A state where economic forces such as supply and demand are balanced and in the absence of external influences the (equilibrium) values of economic variables will not change. |

# 2.1 DEMAND OF GOODS AND SERVICES

When economists talk about **prices**, they are not interested in making judgments but they try to find a practical understanding of what determines prices and why prices change. Consider a price most of us contend with daily: that of a litter of petrol. Why is the average price of petrol in the Nigerian market about N90 per litre in June 2015? Why did the price for petrol raise sharply to about N180 per litre by January 2016? To explain these price movements, economists focus on the determinants of what petrol buyers are willing to pay and what petrol sellers are willing to accept.

The concepts of demand and supply is very important in economic theory, it is so important that it is being asserted that most of the economic problems we encounter everyday can be explained by a careful examination of the demand for and supply of goods and services.

**Price**

The amount of money that has to be paid to acquire a given product.

**Demand**

The amount of goods and services that a consumer is willing to purchase at a given price.

**Quantity demanded**

The quantity demanded of a good that people are willing to buy at a particular price and at a particular point of time.

## 2.1.1 How do we define Demand

Economists use the term **demand** to refer to the amount of some good or service consumers are willing and able to purchase at each price. Demand is based on needs and wants—a consumer may be able to differentiate between a need and a want, but from an economist's perspective they are the same thing. Demand is also based on ability to pay. If you cannot pay for it, you have no effective demand. What a buyer pays for a unit of the specific good or service is called price. The total number of units purchased at that price is called the **quantity demanded**. A rise in price of a good or service almost always decreases the quantity demanded of that good or service. Conversely, a fall in price will increase the quantity demanded. When the price of a litre of petrol goes up, for example, people look for ways to reduce their consumption by combining several errands, commuting by Taxis or mass transit, or taking weekend or vacation trips closer to home. Economists call this inverse relationship between price and quantity demanded the law of demand. The law of demand assumes that all other variables that affect demand are held constant. Demand therefore is defined as the quantity of a commodity that a consumer is willing to buy at a given price and at a particular period of time.

When a consumer's demand is backed up by ability and willingness to pay for the goods, it is called effective demand and this can be differentiated from mere wants or desires which is the case when the demand is not backed up with money.

## 2.1.2 Demand Schedule

A **demand schedule** is a table which shows the different magnitudes of a commodity being demanded for at various levels of prices. In other words, it indicates different quantities of a commodity which will be bought at various prices, at a particular time. For instance, given an individual demand function for tomatoes as Qdt = 24 – 2pt. (When Qdt = quantity demand for t (tomatoes); Pt = Price of commodity t). Various prices of commodity that can be substituted into the demand function to arrive at the individuals demand schedule is as shown below:

Table 2.1: A Demand Schedule for Tomatoes

| Price of Tomatoes per kg | Quantity Demanded per week (Qdm) ( N1000) |
|---|---|
| 70 | 2 |
| 65 | 4 |
| 62 | 6 |
| 58 | 10 |
| 55 | 14 |
| 50 | 18 |
| 45 | 20 |

From the above demand schedule, we can see the quantity demand for tomatoes at various prices. This is however with the assumption that all other factors influencing demand are kept constant. As the price of tomatoes falls, the individual demand for tomato goes up.

**Demand schedule**

A table which list the amount of goods / services that a customer is willing to purchase at different prices.

**Demand curve**

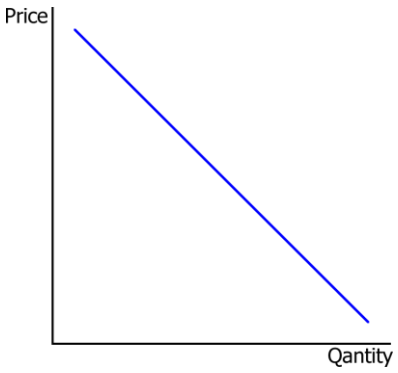
The graphical representation of the relationship between the quantity demanded of a commodity and its prices.

## 2.1.3 Demand Curve

A **demand curve** is the graphical representation of the relationship between the quantity demanded of a commodity and its prices. For example, the above individual demand schedule can be translated into a demand curve by plotting Pm against Qdm.

Demand curve shows the aggregate demand in a curve. It should be noted that market demand is the most important to the producers because they are interested more in the total demand for their products.

Figure 2.1: Demand curve for tomatoes



**Tip**

The terms change in quantity demanded and change in demand are two different concepts.

- Change in quantity demanded refers to change in the quantity purchased due to increase or decrease in the price of a product. In such a case, it is incorrect to say increase or decrease in demand rather it is increase or decrease in the quantity demanded.
- On the other hand, change in demand refers to increase or decrease in demand of a product due to various determinants of demand, while keeping price at constant.
- Changes in quantity demanded can be measured by the movement of demand curve, while changes in demand are measured by shifts in demand curve. The terms, change in quantity demanded refers to expansion or contraction of demand, while change in demand means increase or decrease in demand.

## 2.1.4 Law of Demand

The graphical representation of demand shows that the curve slopes downwards from left to right, i.e. it has a negative slope, this illustrates the law of demand which states that "the higher the price, the lower the quantity demanded and the lower the price, the higher the quantity demanded of a commodity'. The law however holds on the assumption that all other factors remain constant (ceteris paribus). This law implies that consumers purchase more of a commodity at a lower price than at a higher price. Mathematically, it can be expressed as follows:

$$Qd\ \alpha\ 1/p\ or\ Qd\ =\ K\ (1/p)$$

The relationship between the quantity demanded and price gives a negatively sloped curve. The law holds all the time if and only if all other factors remain unchanged but for some exceptional cases which will be discussed later.

**Tip**

The law of demand states that a consumer will buy more of a particular commodity at a low price and buy less of the same commodity when the price is high, assuming all other things are the same.

There are three reasons why more of a commodity is demanded as its price falls.

1. A fall in the price of a commodity makes it cheaper than substitute goods and consumers will therefore switch to the commodity whose price has falling. This is called substitution effect.
2. If the price of a commodity falls, all things being equal, the purchasing power or real income of consumers will increase and they will be able to buy more of the commodity. This is referred to as income effect.
3. As the price of a commodity falls, the consumer will consider that the marginal utility has become higher than the price of the commodity and hence will consume more of the commodity. This is referred to as law of diminishing marginal utility effect.

**Self-check**

**Question**

- Which of the following best describes a demand curve?
  A. The price paid for a quantity of a good or service.
  B. The willingness to pay for a specific quantity of a good over a variety of price and quantity combinations.
  C. The quantity that a consumer will willingly purchase.
  D. The price paid at the equilibrium quantity.

**Feedback**

- B – Yes, demand curve is a graph that shows the amount of a given good people are willing to buy at different prices. Invariably, this is a graph of quantity demanded at varying price.

## 2.1.5 The Ceteris Paribus Assumption

A demand curve or a supply curve is a relationship between two, and only two, variables: quantity on the horizontal axis and price on the vertical axis. The assumption behind a demand curve or a supply curve is that no relevant economic factors, other than the product's price, are changing. Economists call this assumption **ceteris paribus**, a Latin phrase meaning *"other things being equal."* Any given demand or supply curve is based on the ceteris paribus assumption that all else is held equal. A demand curve or a supply curve is a relationship between two, and only two, variables when all other variables are kept constant. If all else is not held equal, then the laws of supply and demand will not necessarily hold.

### When does Ceteris Paribus apply?

Ceteris paribus is typically applied when we look at how changes in price affect demand or supply but it can also be applied more generally. In the real world, demand and supply depend on more factors than just price. For example, a consumer's demand depends on income and a producer's supply depends on the cost of producing the product. How can we analyze the effect on demand or supply if multiple factors are changing at the same time—say price rises and income falls? The answer is that we examine the changes one at a time, assuming the other factors are held constant.

**Ceteris paribus**

An assumption implying "holding other influential things constant".

For example, we can say that an increase in the price reduces the amount consumers will buy (assuming income, and anything else that affects demand, is unchanged). Additionally, a decrease in income reduces the amount consumers can afford to buy (assuming price, and anything else that affects demand, is unchanged). This is what the ceteris paribus assumption really means. In this particular case, after we analyze each factor separately, we can combine the results. The amount consumers buy falls for two reasons: first because of the higher price and second because of the lower income.

## 2.1.6 What Factors affect Demand?

We defined demand as the amount of some product a consumer is willing and able to purchase at each price. That suggests at least two factors in addition to price that affect demand. Willingness to purchase suggests a desire, based on what economists call tastes and preferences. If you neither need nor want something, you will not buy it. Ability to purchase suggests that income is important. Professors are usually able to afford better housing and transportation than students, because they have more income. Prices of related goods can affect demand also. If you need a new car, the price of a Honda may affect your demand for a Ford. Finally, the size or composition of the population can affect demand. The more children a family has, the greater their demand for clothing. The more driving-age children a family has, the greater their demand for car insurance, and the less for diapers and baby formula.

These factors matter both for demand by an individual and demand by the market as a whole. Exactly how do these various factors affect demand, and how do we show the effects graphically? To answer those questions, we need the ceteris paribus assumption.

## 2.1.7 Factors that Shift Demand Curves

Income is not the only factor that causes a shift in demand. Other things that change demand include tastes and preferences, the composition or size of the population, the prices of related goods, and even expectations. A change in any one of the underlying factors that determine what quantity people are willing to buy at a given price will cause a shift in demand. Graphically, the new demand curve lies either to the right (an increase) or to the left (a decrease) of the original demand curve. Let's look at these factors.

### Changing Tastes or Preferences


Figure 2.2: Telephones in vogue - The dialing telephone used to be in vogue, there was high demand for it; but nowadays with the advent of mobile (smart) phones, the demand for the dialing telephone has fallen.

Taste refers to the likes or otherwise of a consumer while fashion relates to what is in vogue at a particular time. A consumer would usually purchase more of the commodity he likes and little or none of what he dislikes. If there is a change in taste in favour of a

particular commodity, the demand for it will be on the increase while the reverse will be the case if there is a change in taste against a commodity. If more consumers now prefer poultry meat to cow meat, the demand for poultry meat will rise while the demand for cow meat will fall. Demand for commodity that is in vogue will rise while the demands for commodity which are out of fashion will fall.

## Changes in the Composition of the Population

A society with relatively more children will have greater demand for goods and services like baby toys and day care facilities. A society with relatively more elderly persons, has a higher demand for nursing homes and hearing aids. Similarly, changes in the size of the population can affect the demand for housing and many other goods.

## Demand for Substitute Goods

The demand for a product can also be affected by changes in the prices of related goods such as substitutes or complements. A substitute is a good or service that can be used in place of another good or service. As electronic books, like this one, become more available, you would expect to see a decrease in demand for traditional printed books. A lower price for a substitute decreases demand for the other product. For example, in recent years, as the price of tablet computers has fallen, the quantity demanded has increased (because of the law of demand). Since people are purchasing tablets, there has been a decrease in demand for laptops, which can be shown graphically as a leftward shift in the demand curve for laptops. A higher price for a substitute good has the reverse effect.

## Demand for Complement Goods

Other goods are complements for each other, meaning that the goods are often used together, because consumption of one good tends to enhance consumption of the other. Examples include breakfast bread and tea; notebooks and pens or pencils, and petrol and cars. If the price of printer rises, since the quantity demanded of printer falls (because of the law of demand), demand for a complement good like cartridge decreases, too. Similarly, a higher price for boat cruise would shift the demand curve for a complement good like ocean view trips to the left, while a lower price for a complement has the reverse effect.

## Changes in Expectations about Future Prices

While it is clear that the price of a good affects the quantity demanded, it is also true that expectations about the future price (or expectations about tastes and preferences, income, and so on) can affect demand. For example, if people learnt that the price of a good like coffee is likely to rise in the future, they may head for the store to stock up on coffee now. These changes in demand are shown as shifts in the curve. Therefore, a shift in demand happens when a change in some economic factor (other than price) causes a different quantity to be demanded at every price.

## Self-Check

**Question**

- Which of the following will result in an outward shift of the demand curve?
  - A. An increase in income, assuming an inferior good.
  - B. An increase in the price of a complement.
  - C. An increase in income, assuming a normal good.
  - D. A decrease in the price of a substitute.

**Feedback**

- The correct option is "C", an economic agent will increase his demand of a normal product if his capacity to acquire more, i.e. income, increases.

## Tip — Summing up Factors that change Demand

Changes in demand, apart from price/income, is shown as a shift in the demand curve.

The effect of changes, other than price, that shift demand curves are summarized in the figure below.

Figure 2.3a: Factors that increase demand

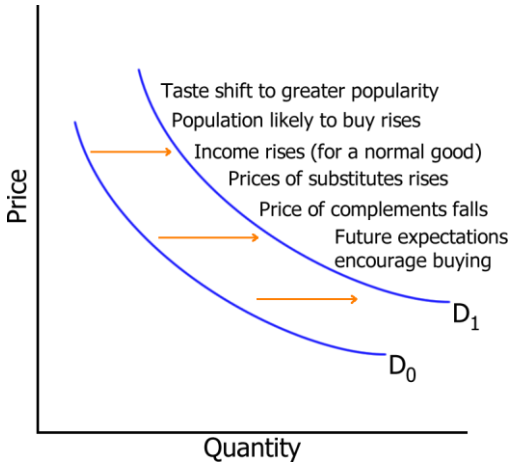
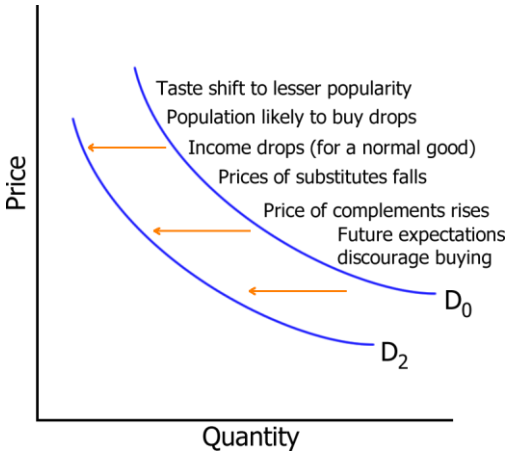



Figure 2.3b Factors that decrease demand




a) A list of factors that can cause an increase in demand from $D_0$ to $D_1$.

b) The same factors, if their direction is reversed, can cause a decrease in demand from $D_0$ to $D_2$

The direction of the arrows indicates whether the demand curve shifts represent an increase in demand or a decrease in demand. Notice that a change in the price of the good or service itself is not listed among the factors that can shift a demand curve. A change in the price of a good or service causes a movement along a specific demand curve, and it typically leads to some change in the quantity demanded, but it does not shift the demand curve.

# 2.1.8 Demand vs Quantity Demanded

In economic terminology, demand is not the same as quantity demanded. When economists talk about demand, they mean the relationship between a range of prices and the quantities demanded at those prices, as illustrated by a demand curve or a demand schedule. When economists talk about quantity demanded, they mean only a certain

point on the demand curve, or one quantity on the demand schedule. In short, demand refers to the curve and quantity demanded refers to the (specific) point on the curve.

# 2.2 SUPPLY OF GOODS AND SERVICES

When economists talk about **supply**, they mean the amount of some good or service a producer is willing to supply at each price. Price is what the producer receives for selling one unit of a good or service. A rise in price almost always leads to an increase in the quantity supplied of that good or service, while a fall in price will decrease the quantity supplied. When the price of petrol rises, for example, it encourages profit-seeking firms to take several actions: expand exploration for oil reserves; drill for more oil; invest in more pipelines and oil tankers to bring the oil to plants where it can be refined into petrol; build new oil refineries; purchase additional pipelines and trucks to ship the petrol to gas stations; and open more gas stations or keep existing gas stations open longer hours. Economists call this positive relationship between price and quantity supplied—that a higher price leads to a higher quantity supplied and a lower price leads to a lower quantity supplied—the law of supply. The law of supply assumes that all other variables that affect supply (to be explained in the next module) are held constant.

## 2.2.1 FACTORS THAT AFFECT SUPPLY

### Production Costs

A supply curve shows how quantity supplied will change as the price rises and falls, assuming ceteris paribus so that no other economically relevant factors are changing. If other factors relevant to supply do change, then the entire supply curve will shift. Just as a shift in demand is represented by a change in the quantity demanded at every price, a shift in supply means a change in the quantity supplied at every price. In thinking about the factors that affect supply, remember what motivates firms: profits, which are the difference between revenues and costs. Goods and services are produced using combinations of labour, materials, and machinery, or what we call inputs or factors of production. If a firm faces lower costs of production, while the prices for the good or service the firm produces remain unchanged, a firm's profits go up. When a firm's profits increase, it is more motivated to produce output, since the more it produces the more profit it will earn. So, when costs of production fall, a firm will tend to supply a larger quantity at any given price for its output. This can be shown by the supply curve shifting to the right.

Take, for example, EMS Speed Post Company that delivers packages around Nigeria and the world at large. The company may find that buying petrol is one of its main costs. If the price of petrol falls, then the company will find it can deliver messages more cheaply than before. Since lower costs correspond to higher profits, the messenger company may now supply more of its services at any given price. For example, given the lower petrol prices, the company can now serve a greater area, and increase its supply.

Conversely, if a firm faces higher costs of production, then it will earn lower profits at any given selling price for its products. As a result, a higher cost of production typically

**Supply**

The amount of goods a producer is willing to sell at the market price at a particular time.

causes a firm to supply a smaller quantity at any given price. In this case, the supply curve shifts to the left.

**Self-Check**

**Question**

- What is the price-to-quantity relationship typically depicted in a supply curve?
  A. Positive correlation between price and quantity supplied.
  B. Downward sloping supply.
  C. Correlation is dependent on demand.
  D. Inverse relationship between price and quantity supplied.

**Feedback**

- A – It's a positive correlation as the quantity supplied will increase with an increase in price.

## Other Factors that affect Supply

Several other things affect the cost of production, too, such as changes in weather or other natural conditions, new technologies for production, and some government policies. The cost of production for many agricultural products will be affected by changes in natural conditions. When a firm discovers a new technology that allows the firm to produce at a lower cost, the supply curve will shift to the right, as well. A technological improvement that reduces costs of production will shift supply to the right, so that a greater quantity will be produced at any given price.

Government policies can affect the cost of production and the supply curve through taxes, regulations, and subsidies. Taxes are treated as costs by businesses.

Other examples of policy that can affect cost are the wide array of government regulations that require firms to spend money to provide a cleaner environment or a safer workplace; complying with regulations increases costs.

A government subsidy, on the other hand, is the opposite of a tax. A subsidy occurs when the government pays a firm directly or reduces the firm's taxes if the firm carries out certain actions. From the firm's perspective, taxes or regulations are an additional cost of production that shifts supply to the left, leading the firm to produce a lower quantity at every given price. Government subsidies reduce the cost of production and increase supply at every given price, shifting supply to the right.

## Summing Up Factors that Change Supply

Changes in the cost of inputs, natural disasters, new technologies, and the impact of government decisions all affect the cost of production. In turn, these factors affect how much firms are willing to supply at any given price.

Figure 2.4a: Factors that increase supply

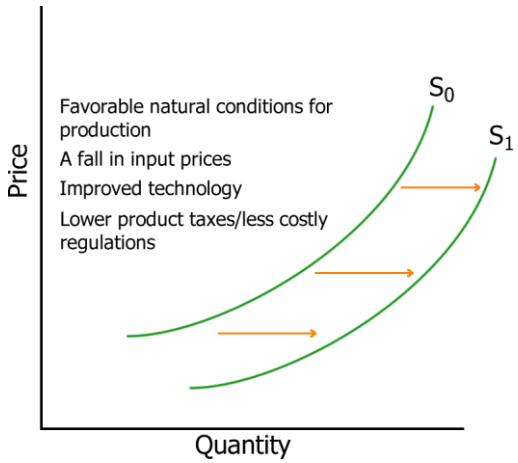
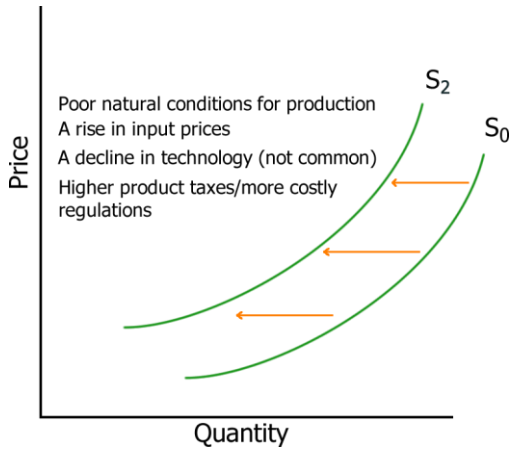



Figure 2.4b: Factors that decrease supply




Factors that can cause an increase in supply from $S_0$ to $S_1$, if their direction is reversed, can cause a decrease in supply from $S_0$ to $S_2$.

Because demand and supply curves appear on a two-dimensional diagram with only price and quantity on the axes, an unwary visitor to the land of economics might be fooled into believing that economics is about only four topics: demand, supply, price, and quantity. However, demand and supply are really "umbrella" concepts: demand covers all the factors that affect demand, and supply covers all the factors that affect supply. Factors other than price that affect demand and supply are included by using shifts in the demand or the supply curve. In this way, the two-dimensional demand and supply model becomes a powerful tool for analysing a wide range of economic circumstances.

## Self-check

**Question**

- Which of these is NOT a factor that affects demand?
  - A. Expectations about prices in the future
  - B. Personal preferences
  - C. The price of complements
  - D. The market structure

**Feedback**

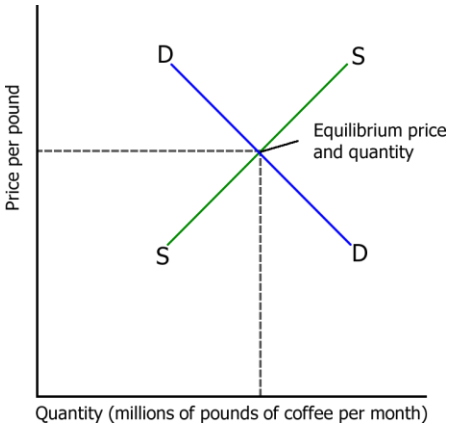
- D – market structure is the odd option.

# 2.3 EQUILIBRIUM — WHERE DEMAND AND SUPPLY INTERSECT

Because the graphs for demand and supply curves both have price on the vertical axis and quantity on the horizontal axis, the demand curve and supply curve for a particular

good or service can appear on the same graph. Together, demand and supply determine the price and the quantity that will be bought and sold in a market.

Figure 2.5: Equilibrium point




## Focus: 2016 Scarcity: Reasons for Toamtoes Scarcity

Have you been to the market lately? Have you tried to buy tomatoes? How was your experience?

Your response will definitely not be different from millions of Nigerians whom prices of tomatoes in the country has left totally heartbroken. Making a pot of stew has become a very expensive venture for the Nigerian population and Jollof rice lovers have resolved to using canned tomato paste. This scarcity in tomatoes has led to an overwhelming increase in its price.

Many of you might not know the real reasons why the scarcity of this staple food has happened and continued to linger. One of the main reasons for this scarcity was the ravaging insect pest known as 'Tuta Absoluta' which has destroyed an estimated 40 percent of anticipated harvest, causing prices to shoot up by 105 percent, from ₦17,000 to ₦35,000 per basket. As a result, many fresh tomato sellers have also resorted to purchasing the produce from neighbouring countries, especially the Republic of Benin and Cameroon, in order to keep up with supply. Tuta absoluta is a harmful leaf mining moth, also called tomato leaf miner and has a strong preference for the tomato plant. This moth travels and breeds in swarms and has a reputation for swiftly ravaging tomato

cultivation in a little above 48 hours – prompting farmers to nickname it Tomato Ebola. The disease has spread across tomato farmlands in the north of Nigeria, including areas in and around Makarfi, Hunkuyi, Soba and Zuntu villages in Kaduna State; in Danja, Katsina State, and in Kadawa, Dakasoye and Kura villages in Kano State.

Even recently, the Kaduna state declared a state of emergency after moths destroyed swathes of tomato fields and according to the Kaduna state agriculture commissioner Manzo Daniel, the outbreak of a moth has destroyed over 80 percent of tomato farms in the state. The commissioner added that, more than 200 tomato farmers in the region have already suffered losses of more than one billion naira from the disease and the situation could get worse if something isn't done fast. Tuta absoluta, which originated in South America and spread to Europe and Africa, quickly develops resistance to pesticides, making it difficult to contain. As a result of all these, as we noted earlier, this scarcity of tomatoes has rapidly increased its price.

If we then decide to plot the graph for the deman of tomatoes, the equilibrium price will be that price whereby demand for tomatoes will equal its supply.

Adapted from: http://www.informationng.com/2016/05/the-reasons-for-nigerias-tomato-scarcity.html

# Session Review

## 2.1 Define and use correctly the terms in bold:

**Demand schedule** is a table that shows the quantity demanded at different prices in the market.

**Demand curve** shows the relationship between quantity demanded and price in a given market on a graph.

**Changes in demand**

- A change in price will result in a movement along a demand curve.
- A change in a non-price variable will result in a shift in the demand curve.

## 2.2 Analyse supply, supply curve and changes in supply

**Supply schedule** is a table that shows the quantity supplied at different prices in the market.

**Supply curve** shows the relationship between quantity supplied and price on a graph.

**Changes in supply**

- A supply curve assumes that other variables that affect the willingness of sellers to supply a good or service are unchanged. It follows that a change in any of those variables will cause a change in supply, which is a shift in the supply curve.
- A change that increases the quantity of a good or service supplied at each price shifts the supply curve to the right.
- An event that reduces the quantity supplied at each price shifts the supply curve to the left.
- A variable that can change the quantity of a good or service supplied at each price is called a supply shifter.

## 2.3 Point out equilibrum point

The equilibrium price and equilibrium quantity occur where the supply and demand curves cross. The equilibrium occurs where the quantity demanded is equal to the quantity supplied.

# Assessment

**SAQ 2.1 (tests Learning Outcome 2.1)**

Nnamdi sells motor parts and Chidi is a mechanic that uses spare parts for his business, if the two of them engage in business transaction, who will engage in demand? Explain the reasons for your answer. Try represent Chidi's demand on a curve and give reasons for what could lead to a change in his demand.

**SAQ 2.2 (tests Learning Outcome 2.2)**

If Patience comes late to class, Dr Ebele will not allow her in his Economics class. We assume that Dr Ebele came before Patience, we assume that Patience is the only person that came late and we also assume that Dr Ebele is always sending late comers out of his class. What economic term describes all these assumptions?

**SAQ 2.3 (tests Learning Outcome 2.3)**

If the petroleum Minister, Dr Ibe Kachuwuku should say there is going to be a temporal fuel scarcity due to the upgrade of the nation's refineries. What will happen to the demand for fuel?

**SAQ 2.4 (tests Learning Outcome 2.4)**

Mr. Raymond, who owns a transport business needs to replace his fleet of cars, called on Nnamdi, a car dealer to provide him with 50 Hilux buses. Who, among the two will engaged in supply?

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 3

# Elasticity of Demand and Supply


## Price of Cement hits all-time High

There were indications on Friday, August 19 2011, that the current hike in the price of cement in Lagos was being dictated by the forces of demand and supply. Last week, SATURDAY PUNCH reported the astronomical rise in the price of cement to around ₦2,200 per 50kg bag. The situation, according to a market survey, might yet assume an alarming dimension unless something is urgently done to check it. Investigations showed that the increase had been fueled by a scarcity that has had spiral effects on the distribution and sale of cement, as well as on the construction industry. In Lagos and Ogun states, the price of one bag of cement rose within one week from ₦2,000 to ₦2,500. The current price is between ₦2,500 and ₦2,800, and it is expected to rise even higher in the days ahead. Some dealers and building engineers, blamed the hike principally on a significant drop in the supply of cement, which they claimed was remotely triggered off by the expiration of the licenses issued to manufacturers to import cement to the country. Others claimed that the shortfall in supply was due to the delay on the part of Customs to clear large shiploads of imported cement at the ports. The price of a six-inch block now sells for between ₦130 and ₦140, while a nine-inch block, which is preferred by most builders, sells for ₦170.

**Reflection**

From the above article, as prices of cement increases, what do you think will happen to the demand for cement and building projects?

Obviuosly, every increase in the price of bag of cement results in a drop of its purchase.

> If the percentage change in the quantity of cement demanded is greater than the percentage change in its price, then the demand for it is eleastic. On the other hand, if the percentage change in quantity demanded of cement in less than the percentage change in its price, the demand is ineleastic.
>
> This is usually true for all commodities.

Adapted from http://www.nairaland.com/740305/price-cement-hits-all-time-high

# INTRODUCTION

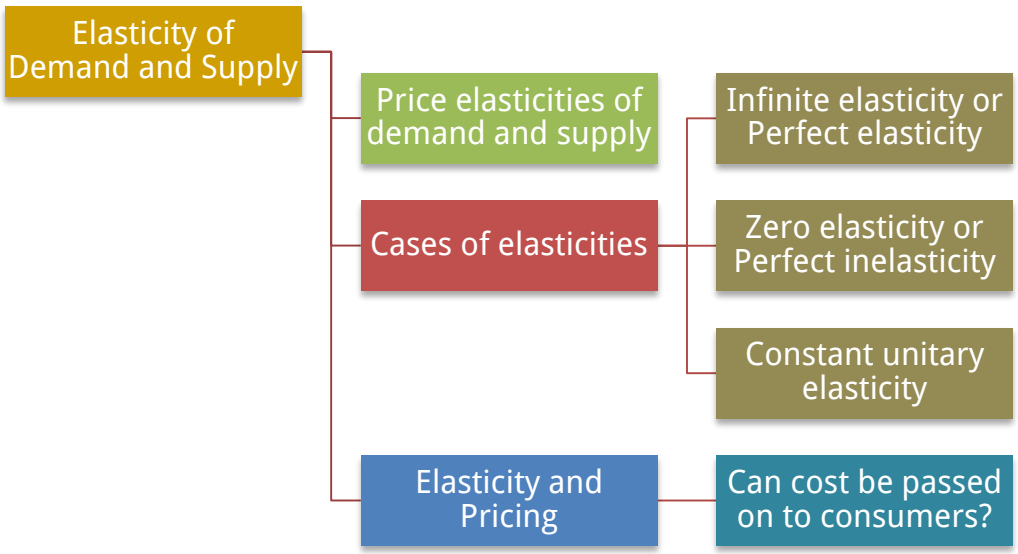
As discussed in the prelimanary to this session, anyone who has studied economics points out the law of demand: a higher price will lead to a lower quantity demanded. What we may not know is how much lower the quantity demanded will be. Similarly, the law of supply shows that a higher price will lead to a higher quantity supplied. The question therefore is: How much higher? This Study Session will explain how to answer these questions and why they are critically important in the real world. To find answers to these questions, we will begin with the concept of elasticity.

**Learning Outcomes**

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

3.1 *discuss* elasticity of demand and supply
3.2 *point out* the cases of elasticity
3.3 *illustrate* how pricing affects elasticity

## Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| **Arc Elasticity method** | An approximation of elasticity. |

| | |
|---|---|
| **Constant Unitary Elasticity** | This occurs when a price change of one percent results in a quantity change of one percent. |
| **Cross Price Elasticity** | The situation whereby the price of one good affects the quantity demanded of a different good. |
| **Price Elasticity** | The relationship between the percentage changes in the quantity demanded (Qd) and quantity supplied (Qs) and the corresponding percent change in price. |
| **Price Elasticity of Demand** | The rate at which percentage change in the quantity demanded of a good or service responds to the percentage change in the price. |
| **Price Elasticity Supply** | The rate at which percentage change in quantity supplied responds to the percentage change in price. |
| **Unitary Elasticity** | Proportional responsiveness of either demand or supply |
| **Zero Elasticity** | The extreme case in which a percentage change in price, no matter how large, results in zero change in quantity. |

# 3.1 PRICE ELASTICITIES OF DEMAND AND SUPPLY

**Elasticity** is an economics concept that measures responsiveness of one variable to changes in another variable. Suppose you drop two items from a second-floor balcony. The first item is a tennis ball. The second item is a brick. Which will bounce higher? Obviously, the tennis ball. We would say that the tennis ball has greater elasticity. Every time a firm considers raising the price that it initially charges, it must consider how much a price increase will reduce the quantity demanded of what it sells. Conversely, when a firm puts its products on sale, it must expect (or hope) that the lower price will lead to a significantly higher quantity demanded.

**Elasticity**
The measure of how demand reacts to changes in price of a particular commodity

**Price Elasticity**
A measure of the effect of a price change or a change in the quantity supplied on the demand for a product or service.

**Price Elasticity of Demand**
A measure of the relationship between a change in the quantity demanded of a particular good and a change in its price.

**Price Elasticity of Supply**
Responsiveness of producers to changes in the price of their goods or services.

Both the demand and supply curve show the relationship between price and the number of units demanded or supplied. **Price elasticity** is the ratio between the percentage change in the quantity demanded (Qd) or supplied (Qs) and the corresponding percent change in price.

- The **price elasticity of demand** is the percentage change in the quantity demanded of a good or service divided by the percentage change in the price.
- The **price elasticity of supply** is the percentage change in quantity supplied divided by the percentage change in price.

Elasticities can be usefully divided into three broad categories: elastic, inelastic, and unitary.

- An elastic demand or elastic supply is one in which the elasticity is greater than one, indicating a high responsiveness to changes in price.
- Elasticities that are less than one indicate low responsiveness to price changes and correspond to inelastic demand or inelastic supply.
- Unitary elasticities indicate proportional responsiveness of either demand or supply, as summarized below.

**Table 3.1 Elastic, Inelastic, and Unitary: Three Cases of Elasticity**

| If... | Then... | It is ... |
|---|---|---|
| % change in quantity > % change in price | % change in quantity% change in price > 1 | Elastic |
| % change in quantity = % change in price | % change in quantity% change in price= 1 | Unitary |
| % change in quantity < % change in price | % change in quantity% change in price< 1 | Inelastic |

To calculate elasticity, instead of using simple percentage changes in quantity and price, economists use the average percent change in both quantity and price. This is called the **Midpoint Method** for Elasticity, and is represented in the following equations:

$$\%\ change\ in\ quantity\ =\ Q2 - Q1\ /\ (Q2 + Q1)2 \times 100$$

$$\%\ change\ in\ price\ = P2 - P1\ /\ (P2 + P1)2 \times 100$$

The advantage of these in Midpoint Method is that one obtains the same elasticity between two price points whether there is a price increase or decrease. This is because the formula uses the same base for both cases.

**Self-check**

**Question**

- _____ is an economics concept that measures responsiveness of one variable to changes in another variable.
  **(a)** Elasticity
  **(b)** Unitary

**Feedback**

- The correct option is (a). The measurement of the responsiveness of one variable to changes in other variable is called Elasticity.

# 3.2 CASES OF ELASTICITY

There are two extreme cases of elasticity: when elasticity equals zero and when it is infinite. A third case is that of constant unitary elasticity. We will describe each case.

## 3.2.1 INFINITE ELASTICITY OR PERFECT ELASTICITY

This refers to the extreme case where either the quantity demanded (Qd) or supplied (Qs) changes by an infinite amount in response to any change in price at all. In both cases, the supply and the demand curve are horizontal as shown in Figure 5.4. While perfectly elastic supply curves are unrealistic, goods with readily available inputs and whose production can be easily expanded will feature highly elastic supply curves. Examples include cake, bread, books and pencils. Similarly, perfectly elastic demand is an extreme example. But luxury goods, goods that take a large share of individuals' income, and goods with many substitutes are likely to have highly elastic demand curves. Examples of such goods are Caribbean cruises and sports vehicles.

Figure 3.1a: Perfectly elastic demand curve

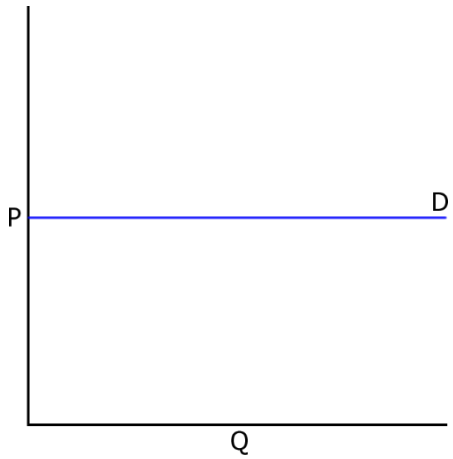
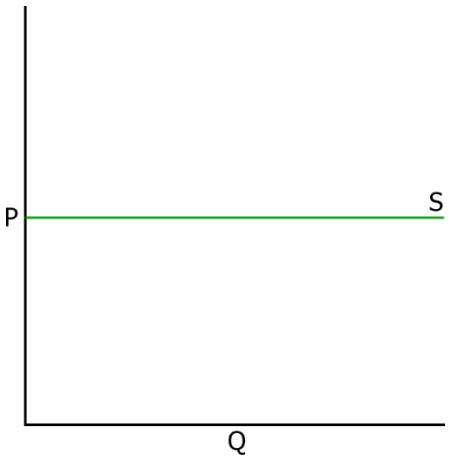



Figure 3.1b: Perfectly elastic supply curve




**Infinite Elasticity Graph**

The horizontal lines show that an infinite quantity will be demanded or supplied at a specific price. This illustrates the cases of a perfectly (or infinitely) elastic demand curve and supply curve. The quantity supplied or demanded is extremely responsive to price changes, moving from zero for prices close to P to infinite when price reach P.

**Self-Check**

**Question**

- _____ is the rate at which quantity demanded or supplied of a particular good or service responds to change in price.

A. Elasticity
B. Demand
C. Supply

**Feedback**

- You are right if you choose "A", it is elasticity that measure the rate of responsiveness of quantity demanded or supplied of a particular good or service to changes in price.

## 3.2.2 Zero Elasticity or Perfect Inelasticity

This refers to the extreme case in which a percentage change in price, no matter how large, results in zero change in quantity. While a perfectly inelastic supply is an extreme example, goods with limited supply of inputs are likely to feature highly inelastic supply curves. Examples include diamond rings or housing in prime locations such as apartments facing Central Park in Federal capita territory, Abuja. Similarly, while perfectly inelastic demand is an extreme case, necessities with no close substitutes are

likely to have highly inelastic demand curves. This is the case of life-saving drugs and petrol.

Figure 3.2a: Perfectly inelastic demand curve

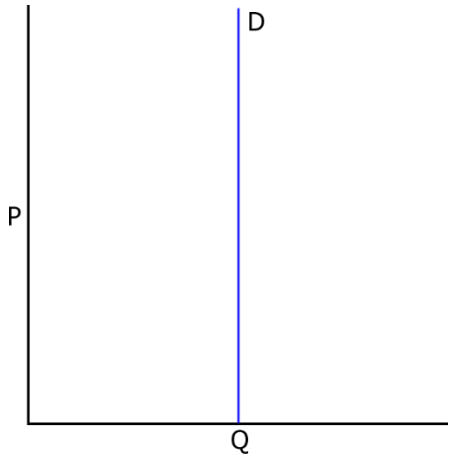
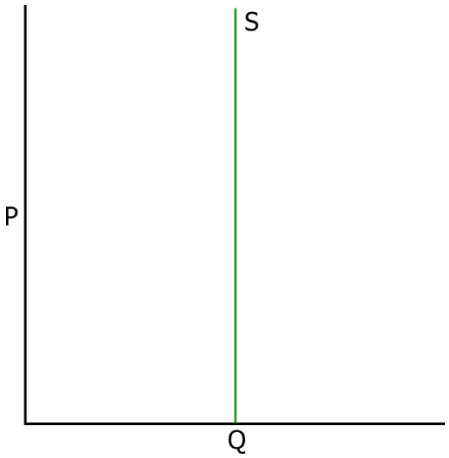



Figure 3.2b: Perfectly inelastic supply curve



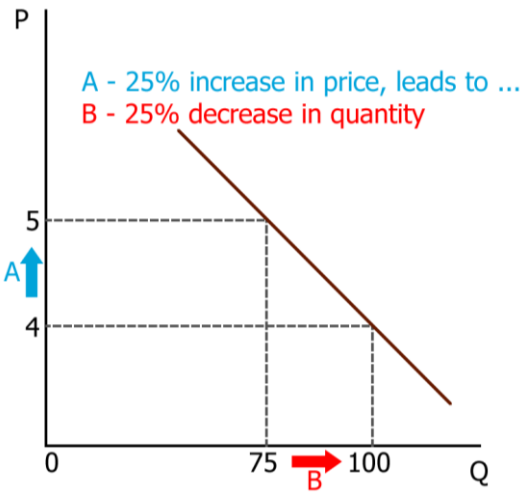

**Perfectly Inelastic or Zero Elasticity Graph**

The vertical supply curve and vertical demand curve show that there will be zero percentage change in quantity (a) supplied or (b) demanded, regardless of the price. This illustrates the case of zero elasticity (or perfect inelasticity). The quantity supplied or demanded is not responsive to price changes.

## 3.2.3 Constant Unitary Elasticity

In either a supply or demand curve, it occurs when a price change of one percent results in a quantity change of one percent. As a result, a demand curve with constant unitary elasticity moves from a steeper slope on the left and a flatter slope on the right—and a curved shape overall.

Figure 3.3: Constant unitary elasticity graph




Unlike the demand curve with unitary elasticity, the supply curve with unitary elasticity is represented by a straight line.

**Note**

Constant Unitary elasticity graph illustrates the cases of a perfectly elastic demand curve.

# 3.3 ELASTICITY AND PRICING

Studying elasticity is useful for a number of reasons, pricing being most important. Let's explore how elasticity relates to revenue and pricing, both in the long run and short run. But first, let's look at the elasticity of some common goods and services.

Table 3.2 shows a selection of demand elasticity for different goods and services drawn from a variety of different studies by economists, listed in order of increasing elasticity.

**Table 3.2 Selected Elasticity of Demand**

| Goods and Services | Elasticity of Price |
|---|---|
| Housing | 0.12 |
| Electricity | 0.20 |
| Petrol | 0.35 |
| Wine | 0.55 |
| Beef | 0.59 |
| Kitchen and household appliances | 0.63 |
| Cable TV (basic rural) | 0.69 |
| Chicken | 0.64 |
| Soft drinks | 0.70 |
| Beer | 0.80 |
| Computer | 1.44 |
| Cable TV (basic urban) | 1.51 |

Note that necessities such as housing and electricity are inelastic, while items that are not necessities such as restaurant meals are more price-sensitive. If the price of the restaurant meal increases by 10%, the quantity demanded will decrease by 22.7%. A 10% increase in the price of housing will cause a slight decrease of 1.2% in the quantity of housing demanded.

## Focus: Does raising Price bring in more Revenue?

Imagine that Tuface (a very popular Nigerian artist) is playing in your school's indoor arena with 1,500 seats. To keep this example simple, assume that Tuface keeps all the money from ticket sales. Assume further that he pays the costs for its appearance, but that these costs, like travel, setting up the stage, and so on, are the same regardless of how many people are in the audience. Finally, assume that all the tickets have the same price. (The same insights apply if ticket prices are more expensive for some seats than for others, but the calculations become more complicated.) The artist knows that it faces a downward-sloping demand curve; that is, if he raises the price of tickets, it will sell fewer tickets.

How should the he then set the price for tickets to bring in the most total revenue, which in this example, because costs are fixed, will also mean the highest profits for the artist? Should the band sell more tickets at a lower price or fewer tickets at a higher price?

The key concept in thinking about collecting the most revenue is the price elasticity of demand. Total revenue is price times the quantity of tickets sold. Imagine that Tuface now starts off thinking about a certain price, which will result in the sale of a certain quantity of tickets. The three possibilities are laid out in Table 3.3. If demand is elastic at that price level, then the artist should cut the price, because the percentage drop in price will result in an even larger percentage increase in the quantity sold—thus raising total revenue. However, if demand is inelastic at that original quantity level, then he should raise the price of tickets, because a certain percentage increase in price will result in a smaller percentage decrease in the quantity sold—and total revenue will rise. If demand has a unitary elasticity at that quantity, then a moderate percentage change in the price will be offset by an equal percentage change in quantity—so the artist will earn the same revenue whether it (moderately) increases or decreases the price of tickets.

Table 3.3 Will Tuface earn more revenue by changing ticket prices?

| If Demand Is . . . | Then . . . | Therefore . . . |
|---|---|---|
| **Elastic** | % change in Qd > % change in P | A given % rise in P will be more than offset by a larger % |
| **Unitary** | % change in Qd = % change in P | A given % rise in P will be exactly offset by an equal fall in O so that total revenue (P*Q) is unchanged |
| **Inelastic** | % change in Qd < % change in P | A given % rise in P will cause a smaller % fall in Q so that revenue (P*Q) rises. |

What if the artist keeps cutting price, because demand is elastic, until it reaches a level where all 1,500 seats in the available arena are sold? If demand remains elastic at that quantity, he might try to move to a bigger arena, so that it could cut ticket prices further and see a larger percentage increase in the quantity of tickets sold. Of course, if the 1,500-seat arena is all that is available or if a larger arena would add substantially to costs, then this option may not work. Conversely, a few artists are so famous, or have such fanatical followings, that demand for tickets may be inelastic right up to the point where the arena is full. These artists can, if they wish, keep raising the price of tickets. Ironically, some of the most popular artists could make more revenue by setting prices so high that the arena is not filled—but those who buy the tickets would have to pay very high prices. However, artists sometimes choose to sell tickets for less than the absolute maximum they might be able to charge, often in the hope that fans will feel happier and spend more on recordings and T-shirts.

## Can Costs be passed on to Consumers?

Most businesses face a day-to-day struggle to figure out ways to produce at a lower cost, as one pathway to their goal of earning higher profits. However, in some cases, the price of a key input over which the firm has no control may rise. For example, many chemical companies use petroleum as a key input, but they have no control over the world market price for crude oil. Coffee shops use coffee as a key input, but they have no control over the world market price of coffee. If the cost of a key input rises, can the firm pass those higher costs along to consumers in the form of higher prices? Conversely, if new and less expensive ways of producing are invented, can the firm keep the benefits in the form of higher profits, or will the market pressure them to pass the gains along to consumers in the form of lower prices? The price elasticity of demand plays a key role in answering these questions.

### Reflection

Imagine that as a consumer of bread, you read a newspaper story that a technological breakthrough in the production of flour has occurred, so that every bread bakery can now buy flour more cheaply than it did before. What does this discovery mean to you?

In this case, the technological breakthrough leads to a much greater quantity being sold in the market at very close to the original price. Consumers benefit more, in general, when the demand curve is more inelastic because the shift in the supply results in a much lower price for consumers.

# Session Review

### 3.1 Discuss elasticity of demand and elasticity of supply

Elasticity measures the responsiveness of the quantity demanded or supplied of a good to a change in its price. It is computed as the percentage change in quantity demanded (or supplied) divided by the percentage change in price.

### 3.2 Point out the cases of elasticity

Elasticity can be described as elastic (or very responsive), unit elastic, or inelastic (not very responsive).
Elastic demand or supply curves indicate that quantity demanded or supplied respond to price changes in a greater than proportional manner.
Inelastic demand or supply curve is one where a given percentage change in price will cause a smaller percentage change in quantity demanded or supplied.
Unitary elasticity means that a given percentage change in price leads to an equal percentage change in quantity demanded or supplied.

### 3.3 Illustrate how pricing affects elasticity

In the market for goods and services, quantity supplied and quantity demanded are often relatively slow to react to changes in price in the short run, but react more substantially in the long run. As a result, demand and supply often (but not always) tend to be relatively inelastic in the short run and relatively elastic in the long run. The tax incidence depends on the relative price elasticity of supply and demand. When supply is more elastic than demand, buyers bear most of the tax burden, and when demand is

more elastic than supply, producers bear most of the cost of the tax. Tax revenue is larger the more inelastic the demand and supply are.

# Assessment

**SAQ 3.1 (tests Learning Outcome 3.1)**

If at ₦50, you buy a bottle of coke every day. When the price increases to ₦100, you buy one bottle every day. When the price gets to ₦150, you only buy one bottle per week. What economic term/model explains these actions? Define the term in your own words

**SAQ 3.2 (tests Learning Outcome 3.2)**

There are different grades of Elasticities, if as the price of Coke increases from ₦50 to ₦100 and to ₦150, you still continue to consume a bottle of coke every day, what grade of elasticity is that?

**SAQ 3.3 (tests Learning Outcome 3.3)**

Prices of goods and services is a major determinant of elasticity. True or false?

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 4

# Consumer Behaviour


Figure 4.1 Consumer satisfaction at taking coke

How many bottles of coke will you take to be satisfied? Seems like *the more you take, the less the urge to take more* at that point in time. Funny enough! But that's *human nature.*

## INTRODUCTION

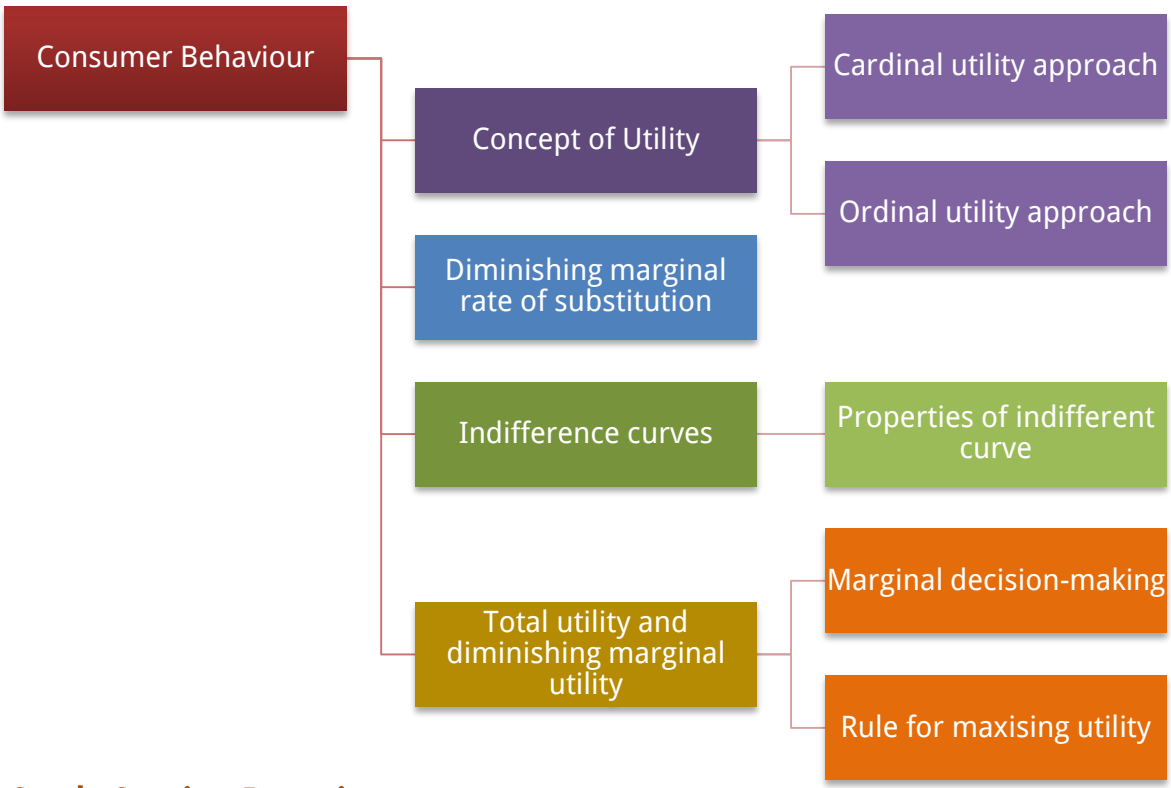
Consumers, in the process of making choice is assumed to be rational, given his income and the prices of the various products/services. He therefore plans the spending of his income so as to attain the highest possible satisfaction. Consumer behaviour is based on the concept of the preferences of consumer and their assumed utility function, it has to do with the study of individuals, firms and government in the way they make their choices, use, and dispose of their products and services and the effects on the consumer and the society. In this study session, we want to look at theory of utility and its measurement.

## Learning Outcomes

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

4.1 *discuss* utility
4.2 *explain* law of diminishing marginal utility
4.3 *outline* an indifference curve
4.4 *differentiate* between total utility and marginal utility

## Session Preview




## Study Session Duration

This Study Session requires a two hour of formal study time. You may spend an additional four hours for revision.

## Terminologies

| | |
|---|---|
| **Budget Constrain** | It shows different combinations of two goods that the consumer can afford with respect to the consumer's income. |
| **Diminishing marginal rate of substitution** | The rate at which a good is substituted for another one by a consumer without changing the consumer's overall level of satisfaction. |

| | |
|---|---|
| **Util** | Measure of utility |
| **Utility** | This is the amount of satisfaction a consumer derives from consumption of a particular commodity. |

# 4.1 THE CONCEPT OF UTILITY

**Utility** is derived from the way we make our choices, this is the satisfaction derived from whatever we use our resources for. The concept of utility is therefore important to the study of consumer behaviour. Utility is a measure of satisfaction derived from application of resources, it is a measure of preferences over some sets of a goods and services, and it represents satisfaction experienced by consumer of goods and services. Utility derived from the consumption of goods and services is usually difficult to measure quantitatively but it is possible to rank them in their order of preferences to the consumer.

This ranking is however responsive to the price of the commodity and the income of the consumer. It has earlier been assumed that consumers are rational in their behaviour and so he will not spend money on an additional unit of good and service of which its marginal utility is not at least equal or greater than that of a unit of an alternative good and service. Therefore, price of a good and service is related to its marginal utility and the consumer will rank his or her preferences accordingly. Utility can be measured using two approaches:

i. Cardinal utility approach
ii. Ordinal utility approach.

## 4.1.1 CARDINAL UTILITY APPROACH

The protagonist of **cardinal utility approach** is of the opinion that utility can be measured by a unit called utils (i.e. unit of utility). For example, according to this concept, a consumer gains a 30 utils from the consumption of milk and 15 utils from margarine. The followings are assumptions under which Cardinal approach works.

i. One util equals one unit of money
ii. Utility of money remain constant
iii. The consumer is reasonably rational
iv. There is diminishing marginal utility of a good and services but a constant marginal utility of money

**Utility**

The amount of satisfaction an individual derives from the consumption of a particular good.

**Cardinal utility approach**

The measure of utility by units called utils.

**Ordinal utility approach**

The measurement of utility by ranking it in order of preference.

## 4.1.2 ORDINAL UTILITY APPROACH

**Ordinal utility approach** is based on the fact that the exact or absolute measurement of utility is not possible, but can be ranked in order of preference. The consumer only needs not know in specific units of the quantity for him to be able to rank various commodities according to the satisfaction that each commodity gives him. The ranking is usually expressed by the consumer's utility function which may be unique to an individual consumer. For example, if higher utility is derived from the consumption of milk compare to the consumption of margarine, the utility derived from milk

consumption can be ranked 1 while that for the consumption of margarine can be ranked 2.

This approach is hinge on the following assumptions:

i. The consumer has a perfect knowledge of the entire range of all available goods.
ii. The consumer has a perfect knowledge of his own income.
iii. The consumer is consistent in his ranking.
iv. A transitive relationship is preserved among commodities; for example, if a consumer prefers sugar to honey and prefers honey to sweetener, he cannot prefer sweetener to sugar.
v. The consumer is rational.
vi. Consumers are assumed to be non-satisfied.

**Self-Check**

**Question**

- What is used to measure the satisfaction derived from application of resources?
  (a) Taste
  (b) Utility

**Feedback**

- The correct option is (a). Utility represents satisfaction experienced by consumer of goods and services. It is therefore a measure of satisfaction derived from application of resources. It is also a measure of preferences over some sets of a goods and services.

# 4.2 DIMINISHING MARGINAL RATE OF SUBSTITUTION

This is the rate of which a commodity is substituted for another one by a consumer and yet be of the same level of overall satisfaction. This assumption is an important concept in indifference curve analysis. This assumption states that the rate of substitution reduces as more of the commodities are consumed. It should be possible to identify a number of different combination that give the consumer the same level of utility. Indifferent curve is therefore the locus of points on the curve each representing a different combination of two substitute goods which yield the same level of utility to a consumer.

**Diminishing marginal rate of substitution**

The rate of exchange between some units of good X and Y which are preferred equally.

**Indifference curve**

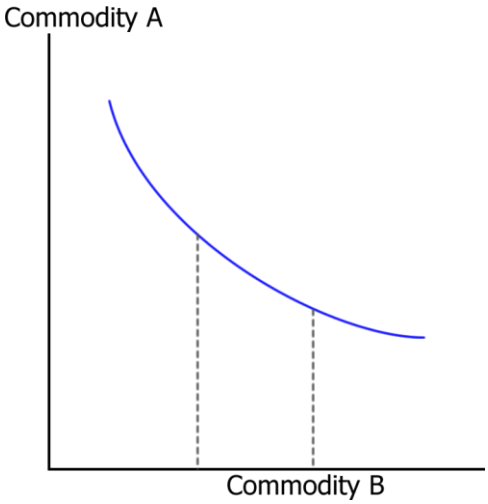
A point on the curve showing combination of two goods that give the consumer equal satisfaction and utility.

# 4.3 INDIFFERENCE CURVES

If all possible combination of commodities A, B, C, D, are ranked on the basis of their utility contents. It should be possible to identify a number of different combination that give the consumer the same level of utility.

**Indifference curve** is therefore the locus of points on the curve each representing a different combination of two substitute goods which yield the same level of utility to a consumer. A consumer is indifferent between any two combinations of two goods when it comes to making a choice between the two goods. This combinations can be plotted on a graph and the resulting curve is called indifference curve or 180 – utility curve.

Figure 4.2: Indifference curve




Indifference curves does not normally indicate the exact value of level of satisfaction and this is because the indifference curve is based on the concept of ordinal utility, which assets that only the qualitative differences in levels of satisfaction can be stated by the consumers.

**Link it Up**

The indifference theory of household behaviour, which established the indifference curve, was developed by Sir John R. Hicks in his book, Value and Capital, linked here. The major innovation of this theory was that it did not invoke the notion of a measurable concept of utility.

IM: www.thefamouspeople.com

## 4.3.1 Properties of Indifferent Curves

Properties of indifference curves are as follows:

I. It shapes downward from left to right: i.e. it has negative slope, this is based on the assumption of non-satisfaction.

II. Indifference curve is convex to the origin: this implies the Marginal Rate of Substitution (MRS) decreases and no two goods can be perfect substitute i.e. convexity of indifference curve to the origin implies that MRS of good A for good B falls as more quantity of A is substituted for good B.

III. Indifference curve cannot intersect each other: this implies that only one indifference curve can pass through a point in indifference map.

IV. Indifference curve to the right of a given indifference curves are higher in terms of satisfaction.

## Self-Check

**Question**

- What is diminishing marginal rate of substitution?

**Feedback**

- The rate at which a commodity is substituted for another one by a consumer and yet be of the same level of overall satisfaction is referred to as Diminishing marginal rate of substitution.

# Focus: Nigerian Consumers have Appetite for Unique, Quality Products


*"Nigerians place preference on local fabrics for social events"*

Figure 4.3 Consumer appetite for Fabric

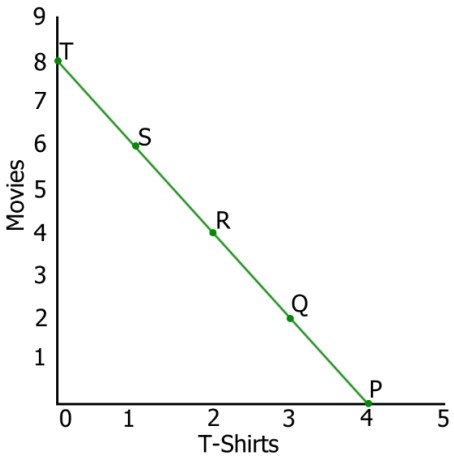
Consumer behaviour in Nigeria has revealed some interesting unique traits about the most lucrative market in Africa, a research by Nielsen, world's leading market research company, has shown. Country Manager, Nielsen, Mr. Harshvardan Sarda, while sharing some of these market insights to clients during 'Nielsen Client Insight Event 2014' in Lagos, said that a typical Nigerian consumer would want to stand out and keep with the trend just as he expects the products he is willing to buy to be fairly common and available. According to him, Nigerians go after affordable and available products. But beyond availability of products, Sarda said there is a whole lot more that is unique to Nigerian consumers: "They want products that are made for them. They don't want something that is being adapted from somewhere else. Nigerians like products which are unique to them and which meet their needs but at the same time must be products with good quality, value, fashionable and trendy." Sarda added that forty percent of Nigerians spend their income on consumer goods, which makes it possible for growth for brands even as he revealed that the 50 percent of the Nigerian population, which are youth, positions Nigeria as a country with high possibilities for trying new products. The youth population, according to him, is educated, mobile; and any serious brand targeting the youth should have presence on the social media to connect with the youth.

Culled from: http://www.vanguardngr.com/2014/03/nigerian-consumers-appetite-unique-quality-products-researc/

# 4.4 TOTAL UTILITY AND MARGINAL UTILITY

To understand how a household will make its choices, economists look at what consumers can afford, as shown in a budget constraint line, and the total utility or satisfaction derived from those choices. In a budget constraint line, the quantity of one good is measured on the horizontal axis and the quantity of the other good is measured on the vertical axis. The budget constraint line shows the various combinations of two goods that are affordable given consumer income. Consider the situation of Joshua, shown in the figure below. Joshua likes to collect T-shirts and watch movies.

Figure 4.4: Choice between Consumption Goods




In Table 4.1 the quantity of T-shirts is shown on the horizontal axis, while the quantity of movies is shown on the vertical axis. If Joshua had unlimited income or goods were free, then he could consume without limit. But Joshua, like all of us, faces a budget constraint. Joshua has a total of N56 to spend. The price of T-shirts is N14 and the price of movies is N7. Notice that the vertical intercept of the budget constraint line is at eight movies and zero T-shirts (N56/N7=8). The horizontal intercept of the budget constraint is four, where Joshua spends of all of his money on T-shirts and no movies (N56/14=4). The slope of the budget constraint line is rise/run or –8/4=–2. The specific choices along the budget constraint line show the combinations of T-shirts and movies that are affordable.

Table 4.1: Total Utility of T-shirt and Movie

| T-Shirts (quantity) | Total Utility | Marginal Utility |
|---|---|---|
| 1 | 22 | 22 |
| 2 | 43 | 21 |
| 3 | 63 | 20 |
| 4 | 81 | 18 |
| 5 | 97 | 16 |
| 6 | 111 | 14 |
| 7 | 123 | 12 |
| 8 | 133 | 10 |

| Movies (quantity) | Total Utility | Marginal Utility |
|---|---|---|
| 1 | 16 | 16 |
| 2 | 31 | 15 |
| 3 | 45 | 14 |
| 4 | 58 | 13 |
| 5 | 70 | 12 |
| 6 | 81 | 11 |
| 7 | 91 | 10 |
| 8 | 100 | 9 |

Joshua has income of ₦56 (Budget constrain). Movies cost ₦7 and T-shirts cost ₦14. The points on the budget constraint line show the combinations of movies and T-shirts that are affordable. Joshua wishes to choose the combination that will provide him with the greatest utility, which is the term economists use to describe a person's level of satisfaction or happiness with his or her choices.

Let's begin with an assumption that Joshua can measure his own utility with something called utils. (It is important to note that you cannot make comparisons between the utils of individuals; if one person gets 20 utils from a cup of coffee and another gets 10 utils, this does not mean that the first person gets more enjoyment from the coffee than the other or that they enjoy the coffee twice as much.). The Table shows how Joshua's utility is connected with his consumption of T-shirts or movies. The first column of the table shows the quantity of T-shirts consumed. The second column shows the total utility, or total amount of satisfaction, that Joshua receives from consuming that number of T-shirts. The most common pattern of total utility, as shown here, is that consuming additional goods leads to greater total utility, but at a decreasing rate. The third column shows marginal utility, which is the additional utility provided by one additional unit of consumption. The equation for marginal utility is:

$$MU = Change\ in\ Total\ Utility/change\ in\ Quantity$$

Notice that marginal utility diminishes as additional units are consumed, which means that each subsequent unit of a good consumed provides less additional utility. For example, the first T-shirt Joshua picks is his favorite and it gives him an addition of 22 utils. The fourth T-shirt is just to something to wear when all his other clothes are in the wash and yields only 18 additional utils. This is an example of the law of diminishing marginal utility, which holds that the additional utility decreases with each unit added.

The rest of Table 4.1 shows the quantity of movies that Joshua attends, and his total and marginal utility from seeing each movie. Total utility follows the expected pattern: it increases as the number of movies seen rises. Marginal utility also follows the expected pattern: each additional movie brings a smaller gain in utility than the previous one. The first movie Joshua attends is the one he wanted to see the most, and thus provides him with the highest level of utility or satisfaction. The fifth movie he attends is just to kill time. Notice that total utility is also the sum of the marginal utilities.

Table 4.2 looks at each point on the budget constraint in Figure 4.1, and adds up Joshua's total utility for five possible combinations of T-shirts and movies.

### Table 4.2 Finding the choice with highest utility

| Point | T-shirts | Movies | Total utility |
|---|---|---|---|
| P | 4 | 0 | 81 + 0 = 81 |
| Q | 3 | 2 | 63 + 31 = 94 |
| R | 2 | 4 | 43 + 58 = 101 |
| S | 1 | 6 | 22 + 81 = 103 |
| T | 0 | 8 | 0 + 100 = 100 |

# 4.4.1 Marginal Decision-Making and Diminishing Marginal Utility

The budget constraint framework helps to emphasize that most choices in the real world are not about getting all of one thing or all of another; that is, they are not about choosing either the point at one end of the budget constraint or else the point all the way at the other end. Instead, most choices involve marginal analysis, which means comparing the benefits and costs of choosing a little more or a little less of a good.

People desire goods and services for the satisfaction or utility those goods and services provide. Utility, is subjective but that does not make it less real. Economists typically assume that the more of some good one consumes (for example, slices of bread), the more utility one obtains. At the same time, the utility a person receives from consuming the first unit of a good is typically more than the utility received from consuming the fifth or the tenth unit of that same good. When Danladi chooses between meals and bus tickets, for example, the first few bus rides that he chooses might provide him with a great deal of utility—perhaps they help him get to a job interview or a doctor's appointment. But later bus rides might provide much less utility—they may only serve to kill time on a rainy day. Similarly, the first meal that Danladi chooses to buy may be on a day when he missed breakfast and is ravenously hungry. However, if Danladi has a meal every single day, the last few meals may taste pretty boring. The general pattern that consumption of the first few units of any good tends to bring a higher level of utility to a person than consumption of later units is a common pattern. Economists refer to this pattern as the law of diminishing marginal utility, which means that as a person receives more of a good, the additional (or marginal) utility from each additional unit of the good declines. In other words, the first slice of bread brings more satisfaction than the sixth.

The law of diminishing marginal utility explains why people and societies rarely make all-or-nothing choices. You would not say, "My favourite food is ice cream, so I will eat nothing but ice cream from now on." Instead, even if you get a very high level of utility from your favourite food, if you ate it exclusively, the additional or marginal utility from those last few servings would not be very high. Similarly, most workers do not say: "I enjoy leisure, so I'll never work." Instead, workers recognize that even though some leisure is very nice, a combination of all leisure and no income is not so attractive. The budget constraint framework suggests that when people make choices in a world of scarcity, they will use marginal analysis and think about whether they would prefer a little more or a little less.

## Self-Check

**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.

## 4.4.2 A Rule for Maximizing Utility

This process of decision making suggests a rule to follow when maximizing utility. Since the price of T-shirts is twice as high as the price of movies, to maximize utility the last T-shirt chosen needs to provide exactly twice the marginal utility (MU) of the last movie. If the last T-shirt provides less than twice the marginal utility of the last movie, then the T-shirt is providing less "bang for the buck" (i.e., marginal utility per dollar spent) than if the same money were spent on movies. If this is so, Joshua should trade the T-shirt for more movies to increase his total utility. Marginal utility per dollar measures the additional utility that Joshua will enjoy given what he has to pay for the good. If the last T-shirt provides more than twice the marginal utility of the last movie, then the T-shirt is providing more "bang for the buck" or marginal utility per Naira, than if the money were spent on movies. As a result, Joshua should buy more T-shirts. Notice that at Joshua's optimal choice of point S, the marginal utility from the first T-shirt, of 22 is exactly twice the marginal utility of the sixth movie, which is 11. At this choice, the marginal utility per dollar is the same for both goods. This is a tell-tale signal that Joshua has found the point with highest total utility.

This argument can be written as a general rule:

$$MU1/P1=MU2/P2$$

*the utility-maximizing choice between consumption goods occurs where the marginal utility per Naira is the same for both goods.*

## Session Review

**4.1 Discuss utility**

Utility refers to the satisfaction a consumer derives from the consumption of a commodity.

**4.2 Explain law of diminishing marginal utility**

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

**4.3 Outline an indifference curve**

The curve shows all combinations of commodities that yield the same level of satisfaction to the household. It is downward sloping indicating that if the household is to have less of one commodity, it must have more of the other to compensate. The slope of the curve is the marginal rate of substitution.

**4.4 Differentiate between total utility and marginal utility**

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

# Assessment

**SAQ 4.1 (tests Learning Outcome 4.1)**

You are just coming from school, hungry and tired. On getting to the room, your room-mate offered you a plate of Apu and Egusi. After eating, you felt rejuvenated. What is the economic term of what you have derived from the plate of Apu and Egusi? Explain.

**SAQ 4.2 (tests Learning Outcome 4.2)**

If you are able to measure the amount of utility you derived from the plate of Apu that you ate as 5 utils. What kind of approach to Utility will you call that? Discuss.

**SAQ 4.3 (tests Learning Outcome 4.3)**

Say, after eating the first plate of Apu and gained 5 utils, you went ahead and took another plate and yet another plate, what will happen to you utils? Discuss the Economic Law that explains the outcome of what happens to your utils.

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 5

# Production Theory

Extensive or Intensive farming? Organic or Natural Tomatoes? Gas cooker / Charcoal for events cooking (www.sbg.nl)

## INTRODUCTION

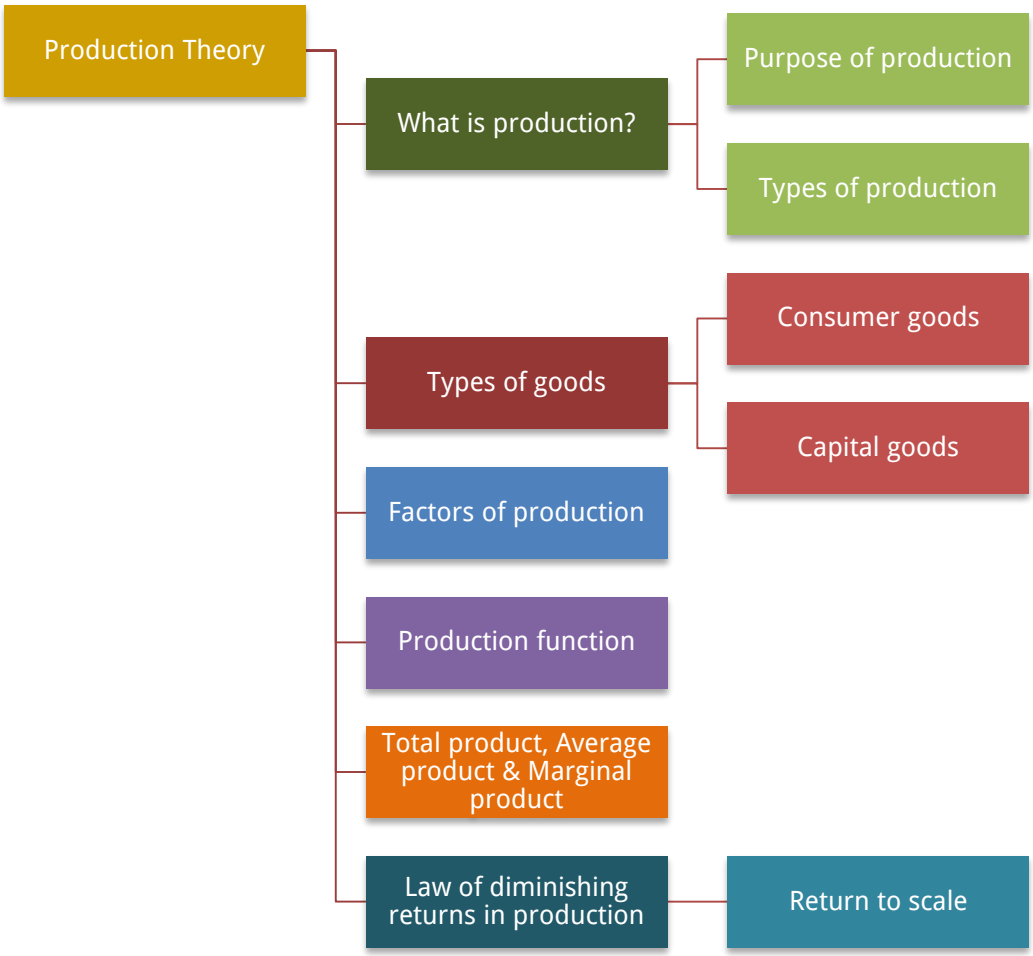
A set of assumptions (i.e accepted facts) attempts to explain how "choice among different ways of producing given commodity" is made; this set of verified and accepted facts is known as production theory. It involves information on how inputs are related to output. In this study session, we will examine in detail the relationship between input and output in the form of production function.

### Learning Outcomes

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

5.1 *highlight* the importance of production
5.2 *point out* the types of goods
5.3 *discuss* the types of factors of production
5.4 *differentiate* between total, average and marginal products
5.5 *apply* the Law of Diminishing Returns

## Session Preview




## Study Session Duration

This Study Session requires a two hour of formal study time. You may spend an additional four hours for revision.

## Terminologies

| | |
|---|---|
| **Direct Production** | When someone produces all the things they need using their own efforts and skills, without the advantages of specialization or the division of labour. |
| **Firm** | a business organization, such as a corporation or a partnership, with different levels of legal protection |
| **Indirect Production** | This is when goods and services are produced in commercial quantity mainly for sales or in exchange for other goods. |

| | |
|---|---|
| **Input** | What is used in the production process to produce finished goods and service. |
| **Output** | The outcome of combination of various inputs which is usually known as goods. |
| **Primary Production** | The production of raw materials for industry. |
| **Production** | The action of making or manufacturing from components or raw materials, or the process of being so manufactured. |
| **Secondary Production** | It involves the transformation of basic raw materials or semi – finished goods into final goods. |
| **Tertiary production** | The segment of the production that provides services to its consumers. |

# 5.1 WHAT IS PRODUCTION?

**Production**

The act of creating a valued and consumable output (good or service).

**Production** involves the creation of utility. It is the creation of wealth in the form of goods and provision of services which are capable of satisfying human wants.

It includes the services rendered by service providers like doctors, accountants, engineers and others. It can also be defined as changing of resources into goods and services e.g. making of cloth from cotton.

## 5.1.1 PURPOSE OF PRODUCTION

The purpose of production is to satisfy human wants. It will be a waste of resources to produce things that people do not require. People also engage in production in order to earn the means with which they will be able to satisfy their own wants and at the same time satisfy the wants of others by producing those things which other people require. For example, a farmer who produces yam helps to satisfy the wants of people for food and at the same time satisfies himself either by consuming part of the yam he produces or by making use of the money from the sales of his yam to purchase other things he requires.

**Note**

Production is a process of combining various material inputs and immaterial inputs (plans, know-how) in order to make something for consumption (the output). Production could also be described as all economic activities which take place to satisfy human wants.

Increased production leads to increase consumption and the higher the level of consumption, the higher the standard of the living of the people. Economic policy of every country aims at increasing the volume of production so as to improve the welfare

of their people. Increasing the materials welfare of the people can therefore be seen as another aim of production.

## 5.1.2 Types of Production

This can also be referred to as the classification of industries. Production can be classified into two major categories; these are direct and indirect productions;

### Direct Production

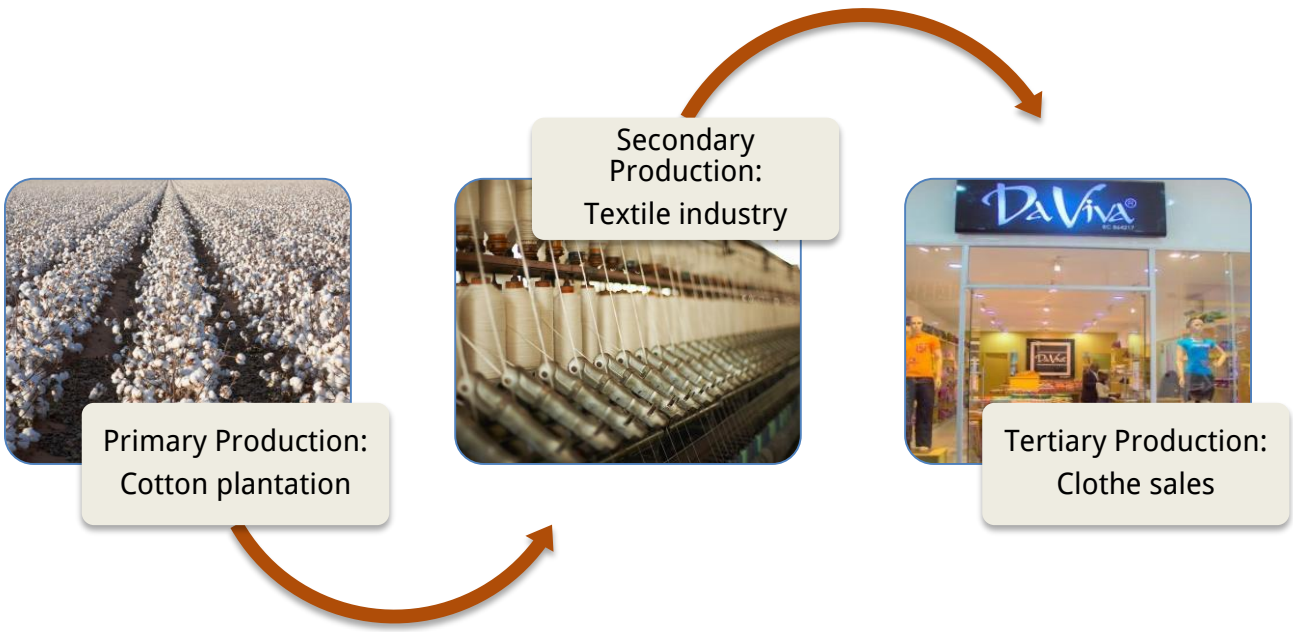
This is the type of production in which an individual produces goods and services only for family use or consumption. The goods and services so produced are not usually for sale; rather they are for the use of the family. It is usually in very small size and family labour is usually employed.

### Indirect Production

This is the type of production in which goods and services are produced in large scale mainly for sales or in exchange for other goods. It involves the use of modern equipment and skilled labour. Indirect production can be sub-divided into three categories. These are:

i. Primary Production
ii. Secondary Production
iii. Tertiary Production

Figure 5.1: Indirect production process




### Primary Production

This is the production that involves the extraction of raw materials provided by nature. It includes all branches of farming, fishing, mining, lumbering, quarrying etc.

### Secondary Production

This type of production involves the transformation of basic raw materials or semi – finished goods into final forms that are acceptable to the consumers. It includes all types of manufacturing and construction work. It is in this type of production that the raw materials from the primary production are converted to finished products. Examples are production of beverages, bread, furniture items etc.

### Tertiary Production

This is concerned with the provision of commercial and professional services to ensure that the goods so produced at the primary and secondary production levels are distributed to the final consumers. The people involved here are those in the commercial services like wholesalers, retailers, transporters and those rendering professional services like doctors, musicians, lawyers etc.

**SELF-CHECK**

**Question**

- How will you define production?

**Feedback**

- Your response should note that production is the process by which inputs are combined, transformed, and turned into outputs that are capable of satisfying human wants.

# 5.2 TYPES OF GOODS

Goods produced are basically of two types:

## 5.2.1 Consumer Goods

These are goods that can satisfy individual or households directly. They are not required for further process of production before they can be used by the consumers. They can be further divided into two:

(i) Durable goods and
(ii) Perishable goods

**Durable goods:** These are consumer goods that can be used over and over again. They last longer and have to be bought at longer intervals; examples are shoes, furniture, radio, television etc.

**Perishable goods:** These are goods that are mostly used at once because they have the nature of getting spoilt quickly. They do not last long and so have to be used soon after purchase. Examples are dairy products, meat, yam, bread.

## 5.2.2 Capital Goods

These are goods that are used for making other goods. They are also known as producer or investment goods. Examples include motor cars, building factories etc. They are very

vital because the larger they are in a country, the greater the amount of consumer goods the country will be able to produce.

**Self-check**

**Question**

- The goods that are mostly used at once because they have the nature of getting spoilt quickly is referred to as _____?
  (a) Durable goods
  (b) Perishable good

**Feedback**

- The correct answer is (b). Perishable goods are goods that gets spoilt easily; while durable goods are consumer goods that can be used over and over again.

# 5.3 FACTORS OF PRODUCTION

Factors of production refer to resources which are combined together to produce goods and services. Factors of production are classified into four categories:

## 5.3.1 LAND

Land includes all natural resources such as soil, water, minerals etc. It is the most important natural resources for agricultural production. The quality of a particular piece of land is dependent on its fertility.

Figure 5.2 Grazing land | The reward for land is rent (cc-edutechportal.org/resource).

Characteristics of land are that it:

i. is immobile
ii. is fixed in supply
iii. varies in quality

iv. has no cost of production
v. is heterogeneous in nature
vi. is subject to law of diminishing return.

## 5.3.2 Labour

This refers to all human efforts in production; it involves physical and mental efforts. The quality or efficiency of labour can be improved by education, good health and training.

*'Labourers' @ construction site* (cc-edutechportal.org/resource)*; the reward for labour is in form of* ***wages*** *and* ***salaries.***

## 5.3.3 Capital

Capital is defined as man-made wealth used in production, in other words they are man-made assets or goods that are used to produce other goods and services. It may also be defined as the stock of previous wealth invested in order to produce future wealth.

*The reward for capital is interest.*

**Tip**

An example of Capital is a farmer that keeps some of his beans for seed so as to plant them and get more beans the following year, these seeds kept aside for planting in the following year is capital. Capital goods are usually called producer goods because to acquire capital, one needs to abstain from present consumption and accumulate for future higher return.

## 5.3.4 Entrepreneur

This is factor of production that coordinates and organizes other factors of production in order to produce goods and services. Entrepreneur takes decision on what to produce, how to produce, for whom to produce and where to produce.

*The reward for Aliko Dangote, as an entrepreneur, is profit.*

## Focus: Availability of Factors of Production: Land

Figure 5.2: Mambila Plateau, Nigeria

Land is one of the three major factors of production; capital, labour and land. It is a generally held belief that the use and control of land as a productive asset requires the establishment of a legal and institutional framework for land management. But that framework has exercised very little influence in Nigeria on the way property rights to

land have developed over the years. This is largely due to the strong feelings which the subject of land evokes. The reasons for this are not farfetched.

Firstly, the supply of land is virtually fixed; yet it is required to provide security (either productive, investment or both) in such forms as food, shelter as well as a base for the rapid transformation of the Nigerian economy.

Secondly, land management in Nigeria comprises a multitude of irregular units in the ownership, use and management by different individuals, corporate bodies and even the state. The major decisions taken by these groups have implications not only for the other groups but also society at large.

Thirdly, land is the focus of much wealth, power and status. Indeed, the current concern in the use of land as a vehicle for investment gain as well as a hedge against inflation under conditions of economic turbulence, points to the centrality of land in present day Nigeria, and more importantly how it is managed.

In considering this topic we shall first discuss the system of land management during the precolonial and colonial periods. These serve as a basis for the discussion of the existing land use management policy the Land Use Act of 1978 which sought to streamline the hitherto various systems of land management in Nigeria. Thereafter, appropriate recommendations are made.

Read more: http://land.onlinenigeria.com/#ixzz46CXJMl6n

## Self-Check

**Question**

- Explain whether each of the following is labor, capital, or a natural resource.

1. An unemployed graduate
2. A university professor
3. The library building at MAUTECH
4. Yankari Game Reserve.
5. An untapped deposit of natural gas
6. The Vice Chancellor office
7. The Kanji power plant

**Feedback**

- The above are classified thus:
  - **(a)** An unemployed graduate offered work counts as labour.
  - **(b)** A university professor is labour.
  - **(c)** The library building at MAUTECH is part of capital.
  - **(d)** Yankari Game Reserve. Those areas of the reserve left in their natural state are a natural resource. Facilities such as visitors' centres, roads, and campgrounds are capital.
  - **(e)** An untapped deposit of natural gas is a natural resource. Once extracted and put in a storage tank, natural gas is capital.
  - **(f)** The VC office is capital.
  - **(g)** The Kanji power plant is capital.

# 5.4 PRODUCTION FUNCTION

**Production function** is the technical relationship which describes the maximum amount of products capable of being produced by a set of input under a given technology. This could be depicted by a graph, table or an equation. A typical general production function with labour, capital and land would mathematically look like:

$$Q = f(L, k, Ha),$$

Where

Q = Quantity of output

L = Labour in number of units

K = Quantity of capital

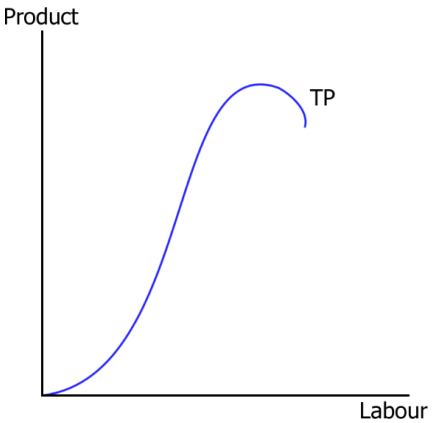
Ha = Quantity of land in hectare

# 5.5 TOTAL PRODUCT (TP), AVERAGE PRODUCT (AP) AND MARGINAL PRODUCT (MP)

## 5.5.1 TOTAL PRODUCT

This is the total quantity of product produced at a particular time by making use of the combination of various inputs. Total Products is expressed mathematically as TP = AP × Quantity of product Input.

Figure 5.2: Total product curve



## 5.5.2 Average Product (AP)

This is defined as the output per unit of the variable factor used. It is obtained mathematically by dividing the Total Product (TP) with the number of inputs employed. For example, **Average Product** (AP) with respect to labour can be expressed as:

$$APL = TP / L$$

Where, APL = Average product per labour used

TP = Total product

L = Unit of labour employed.

Average product can never be negative because negative amount of product can never be produced.

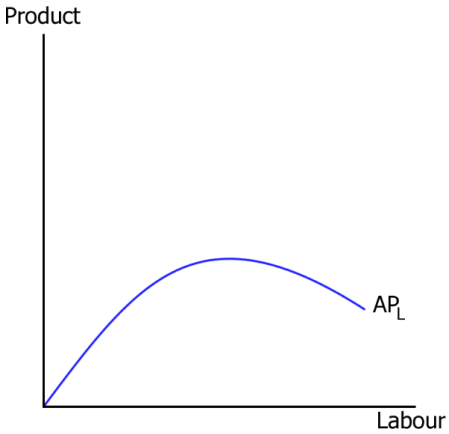
**Average Product**

The quantity of total output produced per unit of a variable input, holding all other inputs fixed.

**Marginal Cost**

The cost incurred by producing one extra item of a product.

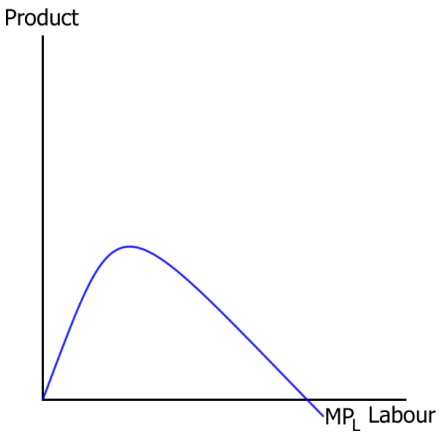
Figure 5.3: Average product curve




## 5.5.3 Marginal Cost

This cost is the additional cost of producing one more unit of output. So it is not the cost per unit of all units being produced, but only the next one (or next few). **Marginal cost** can be calculated by taking the change in total cost and dividing it by the change in quantity. The marginal cost curve is generally upward-sloping, because diminishing marginal returns implies that additional units are more costly to produce. It can be mathematically written as $MPL = \Delta TPL / \Delta L = Change\ in\ TP / change\ in\ Input$

Figure 5.4: Marginal Product Curve



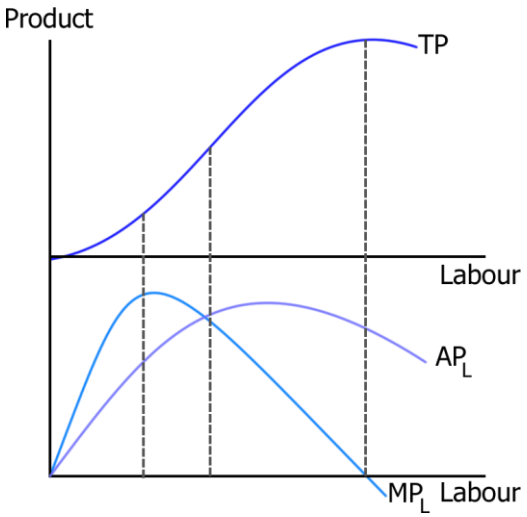
## 5.5.4 Marginal Product Curve for Labour

The relationship between total product, Average product and Marginal product with respect to labour input can be illustrated by the following schedule and combined curves.

Table 5.1: Total product, Average product and Marginal product Schedules

| Labour | Total Product of Labour TPL (2) | Average Product of Labour (3) 2 ÷ 1 | Marginal Product of Labour MPL (4) ΔTP/ΔL |
|---|---|---|---|
| 1 | 8 | 8 | - |
| 2 | 24 | 12 | 16 |
| 3 | 48 | 16 | 24 |
| 4 | 80 | 20 | 32 |
| 5 | 90 | 18 | 10 |
| 6 | 96 | 16 | 6 |
| 7 | 91 | 13 | -5 |

Figure 5.5: Combined graphs of total, average and marginal products




This combined curves and the schedule reveals the following:

I. MP is positive when TP is increasing, it is zero when TP is at constant maximum, and negative when TP decreases. When TP is increasing at an increasing rate, MP will be increasing, and when TP is increasing at a decreasing rate, MP will be decreasing but positive and higher than the AP.

II. When AP is increasing, MP is greater than AP because for AP to increase as more inputs are employed, the addition to the products from each additional input (MP) must be greater than the AP from the preceding input.

III. Also, when AP is decreasing, MP is less than AP. If AP doesn't change as more inputs are employed AP and MP are equal, that is AP = MP when AP is maximum.

## Self-check

**Question**

- _____ is defined as the output per unit of the variable factor used.
  (a) Average product
  (b) Marginal cost

**Feedback**

- The correct answer is (a). The output per unit of the variable factor used is defined as Average product.

## Tip

Where marginal product is above average product, average product rises. Where marginal product is below average product, average product falls. The marginal product curve intersects the average product curve at the maximum point on the average product curve.

- ⇨ When TPL is increasing, MPL > 0
- ⇨ When TPL is at maximum, MPL = 0
- ⇨ When TPL is decreasing, MPL < 0
- ⇨ MPL is at maximum at inflexion point of the TPL curve
- ⇨ When APL is at a maximum, MPL = APL

## Activity

Suppose Tukor Enterprise gets some new equipment for producing textiles. The table below gives its new production function.

| Units of labour per day | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Rolls per day | 0 | 2 | 5.5 | 9.5 | 12 | 14 | 15 | 15.5 | 15 |
| MP | | | | | | | | | |
| AP | | | | | | | | | |

A) Compute marginal product and average product and fill in the bottom two rows of the table.

B) Draw a graph showing Tukur Enterprise new total product curve.

C) Sketch the marginal and average product curves. Remember to plot marginal product at the midpoint between each input level.

D) Indicate the regions where Tukur experiences increasing marginal returns, diminishing marginal returns, and negative marginal returns.

# 5.6 THE LAW OF DIMINISHING RETURNS IN PRODUCTION

The law of diminishing return states that as successive units of variable factors are combined with one or more fixed factors, the output will increase at first, but after some time the addition of more inputs will result to less additional units of output i.e. the addition to total output will begin to decrease and the total product from the input will begin to increase at a decreasing rate. It is a short run law because all factors are variable in the long run. The law can be illustrated using the table below.

Table 5.2: Diminishing return on cowpea production

| Fixed factor Land (Acre) | Variable factor fertilizer (bag) | Total product cowpea (kg) | Change in output (MP) |
|---|---|---|---|
| 1 | 1 | 10 | - |
| 1 | 2 | 30 | 20 |
| 1 | 3 | 60 | 30 |
| 1 | 4 | 120 | 60 |
| 1 | 5 | 100 | 20 |
| 1 | 6 | 90 | -10 |

## 5.6.1 RETURN TO SCALE

Return to scale describes the response of output to a change in the level of all inputs employed. If the response of output to change in input is by the same proportion, we have a situation of constant return to scale. That is, if for example all inputs is increased by 5 percent and the new output is also 5 percent greater than the original output, the production exhibits a constant return to scale, when this happens, we have a linear relationship between the input and output. This nature of relationship is not characteristics of agricultural productions.

If output increases by a smaller percentage than increase in input, we have a situation of decreasing return to scale. For example, if all inputs are multiplied by 5 percent and the new output is just 2.5 percent above the original output. The production process would be said to exhibit decreasing return to scale. That is, each additional unit of the variable input adds less to the output than the previous unit. This type of production process is most common in agriculture.

Increasing return to scale occurs if increase in input brings about a more than proportionate increase in output, that is, for instance, if input employed is multiplied by 5 percent while increased in output is by 7 percent, we have a situation of increasing return to scale. This situation occurs mainly at the early stages of agricultural production.

## Self-Check

**Question**

- When will you say diminishing marginal productivity will occur?
  a) when the marginal product curve begins to slope downward.
  b) when each additional unit of the variable input has, on average, fewer units of the fixed input with which to work.
  c) when adding one more unit of the variable input reduces total product.

**Feedback**

- Option "a" is the definition of marginal productivity; while option"b" gives the reason while that situation occurs.
  If you have chosen option "c", then you are wrong. It is when total product increase at a decreasing rate that marginal productivity occurs.

# Session Review

### 5.1 highlight the importance of production

Production is the process by which inputs are combined, transformed, and turned into outputs. It is therefore the major business of every economy.

### 5.2 point out the types of goods

Basically, types of goods refers to the context to which commodities are put up to, vis-à-vis consumer goods and capital goods.

### 5.3 discuss the types of factors of production

The factors of production in an economy are its labour, capital and natural resources.

- Labour is the human effort that can be applied to the production of goods and services. People who are employed or would like to be are considered part of the labor available to the economy.
- Capital is a factor of production that has been produced for use in the production of other goods and services. Office

### 5.4 differentiate between total, average and marginal products

The total product is the total amount produced during some period of time by all factors of production employed. The amount by which output rises with an additional unit of a variable factor is the marginal product of the variable factor. Average product of a variable factor is the output per unit of variable factor.

### 5.5 apply 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".

buildings, machinery, and tools are examples of capital.

- Natural resources are the resources of nature that can be used for the production of goods and services.

Finally, we have entrepreneur who mixes the other three factors of production.

# Assessment

**SAQ 5.1 (tests Learning Outcome 5.1)**

How important is production in an economy?

**SAQ 5.2 (tests Learning Outcome 5.2)**

There are two types of goods; one is consumable goods, which satisfies individual or households directly, what is the other type of goods called? And what is it used for?

**SAQ 5.3 (tests Learning Outcome 5.3)**

If you are to start a production firm today, what are those Economic Factors that you will need?

**SAQ 5.4 (tests Learning Outcome 5.4)**

After securing Land, Labour, Capital and Entrepreneur, what are the other likely costs you will incur? From those costs, can you differentiate which is Total, Average and Marginal cost? Can you explain your understanding of these costs?

**SAQ 5.5 (tests Learning Outcome 5.5)**

If the law of diminishing return states that as successive units of variable factors are combined with one or more fixed factors, the output will increase at first, but after some time the addition of more inputs will result to less additional units of output, what is returns to scale.

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 6

# Cost Theory

Figure 6.1 Investment in a Textile Industry (www.peoplesdailyng.com/let-textile-industry-bounce-back)

## INTRODUCTION

The previous Study Session exposes you to assumptions of production. In this study session, we will examine cost of production. Theory of cost has to do with the cost of producing a commodity. Costs is derived from the quantities of the variable and fixed inputs used in producing. Take for instance, in a textile firm, money value of raw materials, labour, power and manufacturing site all add up to cost of production. Cost therefore expresses the relationship between total production cost and quantities of output.

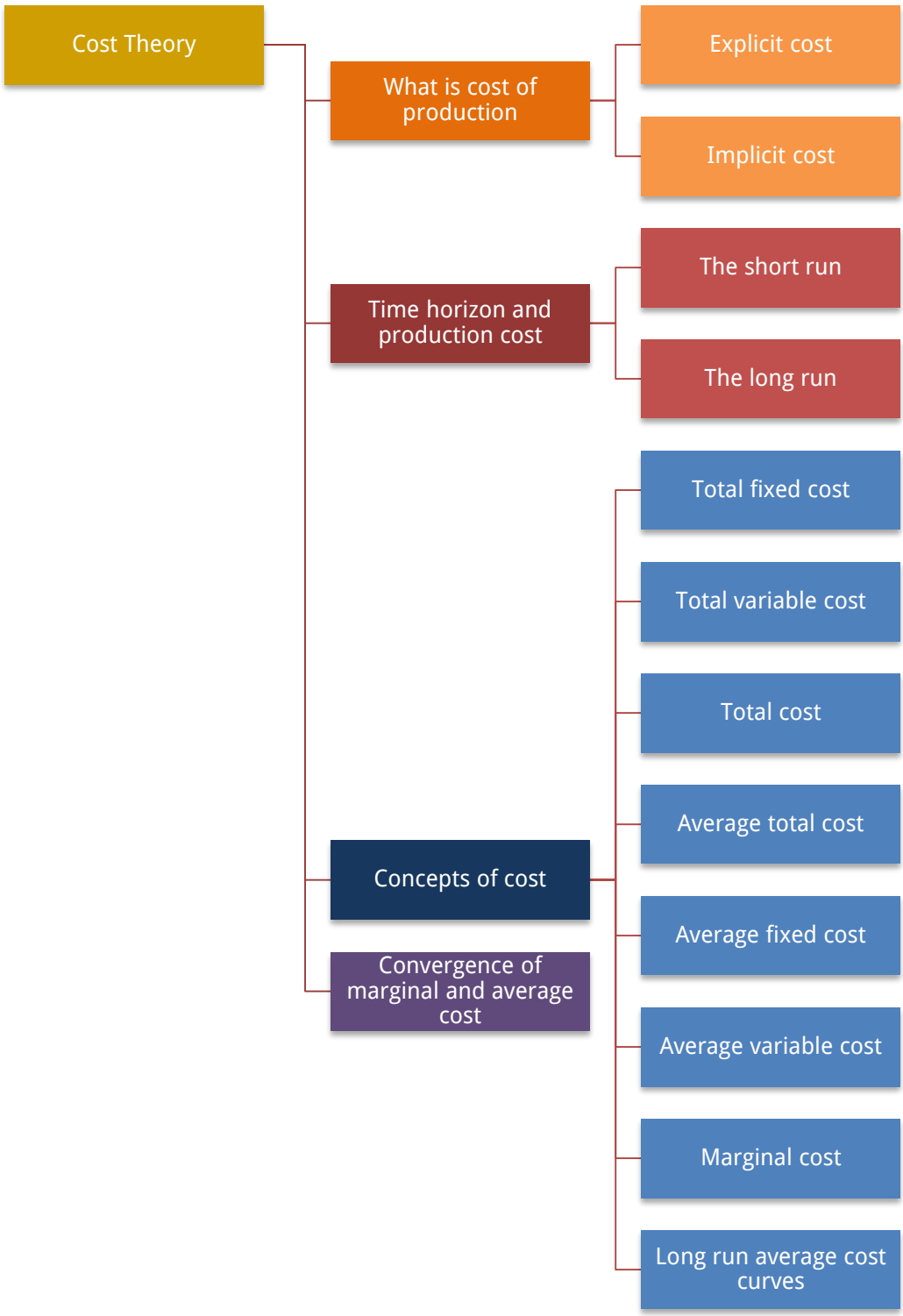
### Learning Outcomes

Upon completion of this study session, you will be able to:

6.1 *discuss* production cost

6.2 *list* and *discuss* different concepts of cost in relation to time Horizon in cost of production

## Study Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| Cost of Production | The value of inputs used in production process in monetary terms. |
| Explicit Cost | Direct payment made to others in the course of running a business. |
| Implicit Cost | The opportunity cost equal to what a firm must give up in order to use a factor of production for which it already owns and thus does not pay rent. |
| Short Run | The production period that is too short for a firm to vary all its fixed factors of production. |
| Long Run | A production period that is long enough for the firm to vary all its fixed factors of production. |

# 6.1 WHAT IS COST OF PRODUCTION?

Cost of production refers to the monetary value of the inputs used in production process. The cost of producing a product such as eggs, cat fish or maize is the expenses incurred in producing a particular quantity of the product in a particular period of time. Profit is arrived at by subtracting costs from revenue, the understanding of the nature and structure of production cost is therefore very germane. The cost being referred to here is the accounting costs of production, that is, the cost of raw materials used in the production process such as cost of labour, planting materials, maintenance and other administrative cost etc. This accounting cost is more important to the accountant than any other cost. To the economists, cost of production encompasses accounting costs and opportunity cost which may also be a cost to the society too. Accounting cost is always referred to as private cost because it is the money cost which is the actual amount of money spent by the producer in the process of production. It is the price that must be paid to get the services of factors of production. Private costs are of two types:

(i) Explicit cost and
(ii) Implicit cost.

## 6.1.1 EXPLICIT COST

These costs are the money outlays made by the producer to meet the direct cost of production, that is, the actual expenditures on the factors of production used in the process of production e.g. payment for raw materials, wages and salaries administrative cost, overhead costs etc.

## 6.1.2 Implicit Cost

These costs are the cost of self-owned assets or self-provided labour which are often overlooked when computing the production expenses of the firm. For example, the salary of sole proprietor of a poultry farm who does not set any salary aside for himself but only takes the firm's profit as payment for his effort in the business.

## Focus: Aircraft Harmonization to Reduce Effect of Rising Operational Cost


Figure 6.1: Air Nigeria

Experts in Nigeria's aviation sector have pointed the way out for local airlines currently threatened by rising operational costs and other challenges to stay aloft and even enhance their margins. They say a deliberate harmonization in aircraft acquisition is the ultimate solution to the travails of local airlines dogged by rising operational costs, especially high foreign maintenance charges paid in foreign currency.

Airlines can harmonize their aircraft types by buying the same aircraft from one manufacturer. This way, airlines can save cost by purchasing parts in bulk from a particular manufacturer.

Aircraft maintenance is the biggest challenge of local airlines because much of this is done abroad and paid for in foreign exchange. Government should therefore create an enabling environment, put regulations and quality for harmonization of aircraft to thrive. Furthermore, government needs to set a standard of the minimum number of aircraft airlines should have, provide a hangar that will sustain and maintain that airline and commercialized the hangar.

Read more: http://land.onlinenigeria.com/#ixzz46CXJMl6n

**Task**

Will you consider operational cost as explicit or implicit cost?

**Self-check**

**Question**

- _____ costs are the money outlays made by the producer to meet the direct cost of production.

**Feedback**

- The money outlays made by the producer to meet the direct cost of production is referred to as Explicit cost

# 6.2 TIME HORIZON AND PRODUCTION COST

In production cost, it is important to recognize the difference between economic time horizons: The short run and the long run.

## 6.2.1 THE SHORT RUN

In production is recognized as the production period which is so short for the firm to vary the amount of its fixed factors such as land, building, machinery etc. It is assumed that in the short run, one or more factors are fixed in quantity and variable factors can be differentiated from fixed factors. In the short run, total production cost is made up of the implicit and explicit cost of fixed input used in production and total expenditure on variable input used.

## 6.2.2 THE LONG RUN

This is a planning period in production that is long enough for the firm to be able to vary the amount of all factors of production used in production process. All resources are variable and we cannot be talking of classifying factors into variable and fixed. The long run is a planning period while the short run is the production period. The long run is a period which is sufficiently long enough to permit desired adjustments to the size of enterprise (including the size of capital investment and production technology). It can then be said that all inputs and hence all costs are variable in the long run.

**SELF-CHECK**

**Question (True / False)**

- Cost could be either explicit or implicit.

**Feedback**

- True: 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

# 6.2.3 Some Concepts of Cost

## Total Fixed Cost (TFC)

This refers to the costs which do not vary with the level of production and which are incurred whether production takes place or not, sometime, they are referred to as overhead cost. Fixed cost includes all the cost of plant and machinery, land, buildings, top management salaries etc. Total Fixed Cost is always constant in the short run.

## Total Variable Cost (TVC)

This refers to the cost which varies with the level of production; it is the cost per unit for all variable factors used in production. The higher the scale of production the greater the variable cost. When the output is zero, the variable cost will also be zero and when the level of production increases, the variable cost also increases. Examples are cost of planting materials, fertilizers, animal feeds etc.

## Total Cost (TC)

This is the total expenses of a firm in the production of a given level of output. It is the sum of variable cost and fixed cost.

$$TC = TFC + TVC$$

## Average Total Cost (ATC)

This is defined as the unit cost of production; it is derivable by dividing total cost by the number of output produced.

$$ATC = TC/Q$$

Average total cost can also be arrived at by adding the Average fixed cost to Average variable cost: i.e.

$$ATC = AFC + AVC$$

Average total cost (sometimes referred to simply as average cost) is total cost divided by the quantity of output. Since the total cost of producing 40 haircuts is N320, the average total cost for producing each of 40 haircuts is N320/40, orN8 per haircut. Average cost curves are typically U-shaped, as shown below Average total cost starts off relatively high, because at low levels of output total costs are dominated by the fixed cost; mathematically, the denominator is so small that average total cost is large. Average total cost then declines, as the fixed costs are spread over an increasing quantity of output. In the average cost calculation, the rise in the numerator of total costs is relatively small compared to the rise in the denominator of quantity produced. But as output expands still further, the average cost begins to rise. At the right side of the average cost curve, total costs begin rising more rapidly as diminishing returns kick in.

## Average Fixed Cost (AFC)

This is derived from Total Fixed Cost (TFC) by dividing the Total Fixed Cost (TFC) by the unit of output. Total fixed cost is constant at all levels of output and hence Average Fixed Cost (AFC) will be falling as the level of output rises.

$$AFC = TFC/Q$$

## Average Variable Cost (AVC)

This is the total variable cost divided by the unit of output produced; it can also be defined as the increase in the total cost resulting from producing one additional unit of output. Average variable cost obtained when variable cost is divided by quantity of output. For example, the variable cost of producing 80 haircuts is ₦400, so the average variable cost is ₦400/80, or ₦5 per haircut. Note that at any level of output, the average variable cost curve will always lie below the curve for average total cost. The reason is that average total cost includes average variable cost and average fixed cost. Thus, for Q = 80 haircuts, the average total cost is ₦8 per haircut, while the average variable cost is ₦5 per haircut. However, as output grows, fixed costs become relatively less important (since they do not rise with output), so average variable cost sneaks closer to average cost.

### Self-check

**Question**

- _____Cost is defined as the unit cost of production.

**Feedback**

- The unit cost of production is referred to as Average total cost; it is derivable by dividing total cost by the number of output produced.

## Marginal Cost (MC)

The marginal cost is the extra cost of producing one additional unit of output. Since the fixed cost is constant, the marginal cost means extra variable cost.

The relationships between the Average Total Cost (ATC), Average Fixed Cost (AFC), Average Variable Cost (AVC) and Marginal Cost are illustrated in Table 6.1 and figure 6.2.

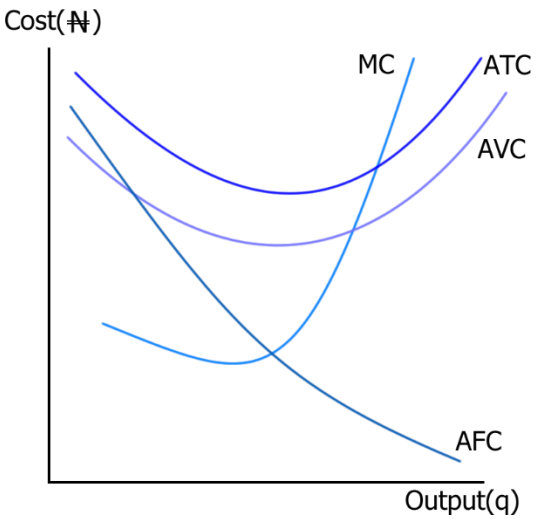
From the Table and figure, the following should be noted:

- Average cost is equal to the marginal cost where the marginal cost is at minimum.
- At low level of output, the marginal cost is below the average costs.
- The marginal cost also reaches its lowest point at a lower level of output than the average variable cost and average cost curves.

Table 6.1: Total, Average and Marginal Cost

| Output level | TFC (N) | TVC (N) | TC (TFC + TVC) | AFC (TFC/Q) | AVC (TVC/Q) | AC (AFC + AVC) | MC (dTC/dQ) |
|---|---|---|---|---|---|---|---|
| 1 | 1000 | 300 | 1300 | 1000 | 300 | 1300 | - |
| 2 | 1000 | 350 | 1350 | 500 | 175 | 675 | 5- |
| 3 | 1000 | 800 | 1800 | 333.3 | 266.6 | 599.9 | 250 |
| 4 | 1000 | 100 | 2000 | 250 | 250 | 500 | 200 |
| 5 | 1000 | 1200 | 2200 | 200 | 240 | 440 | 200 |
| 6 | 1000 | 1450 | 2450 | 166.6 | 241 | 407.6 | 250 |
| 7 | 1000 | 1800 | 2800 | 142.8 | 257.10 | 399.9 | 350 |
| 8 | 1000 | 2500 | 3500 | 125 | 312.5 | 437.5 | 700 |
| 9 | 1000 | 3400 | 4400 | 111.1 | 377.7 | 488.8 | 900 |
| 10 | 1000 | 4400 | 5400 | 100 | 440 | 540 | 1000 |

Figure 6.2 Short run marginal and average cost curves




**Note**

The average fixed cost falls progressively as the output level expands. The marginal and average cost eventually rises as a result of diminishing marginal returns to the variable factors.

**Self-Check**

**Question**

- Under what conditions is the profit of a firm maximized in the short run?

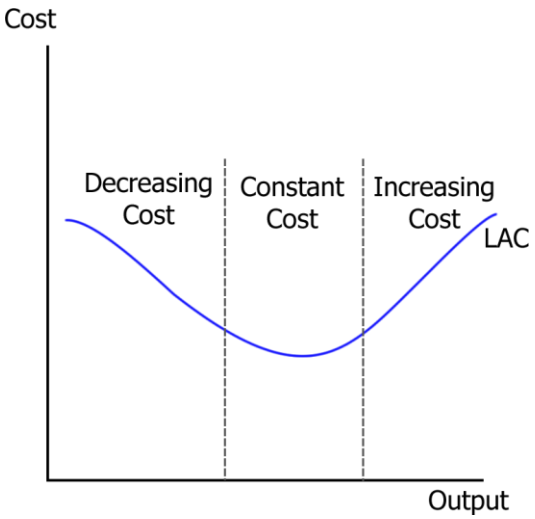
**Feedback**

- The profit of a firm in the short run can be maximized under two scenario:
  A. When the difference between total revenue and total cost is the largest and positive and positive, and
  B. When marginal cost equal marginal revenue, that is MC= MR

## Long Run Average Cost Curves

The long run in production is the period long enough for the entrepreneur to make adjustments in the size of the enterprise. There are no fixed factors and hence no fixed cost. i.e. all costs are variable and the firm is able to produce at desired scale. The long run average cost curve, like short run average cost curves are U shaped but the reasons for the U shape in each case differs. The reason for the initial decline in the average cost in the short run is the law of diminishing returns which arises as a result of the presence of fixed input in the short run. In the long run average cost curve, the decline in the curve is as a result of economies of scale because there are no fixed inputs and diseconomies of scale is responsible for the rising part of the LAC curve. As output increases, increasing return to scale brings about decreasing cost and as output further increases diseconomies of scale may set in, this causes a rise in the LAC curve. The minimum level of the LAC curve depicts a constant return to scale level of operation and this is assumed to be the optimum level of production.

Figure 6.2 The U shape of LAC curve




# 6.2.4 Convergence Point of Marginal and Average Costs

The marginal cost line intersects the average cost line exactly at the bottom of the average cost curve. The reason why the intersection occurs at this point is built into the economic meaning of marginal and average costs. If the marginal cost of production is

below the average cost for producing previous units, as it is for the points to the left of where MC crosses ATC, then producing one more additional unit will reduce average costs overall—and the ATC curve will be downward- sloping in this zone. Conversely, if the marginal cost of production for producing an additional unit is above the average cost for producing the earlier units, as it is for points to the right of where MC crosses ATC, then producing a marginal unit will increase average costs overall—and the ATC curve must be upward-sloping in this zone. The point of transition, between where MC is pulling ATC down and where it is pulling it up, must occur at the minimum point of the ATC curve. This idea of the marginal cost "pulling down" the average cost or "pulling up" the average cost may sound abstract, but think about it in terms of your own grades. If the score on the most recent quiz you take is lower than your average score on previous quizzes, then the marginal quiz pulls down your average. If your score on the most recent quiz is higher than the average on previous quizzes, the marginal quiz pulls up your average. In this same way, low marginal costs of production first pull down average costs and then higher marginal costs pull them up.

**Reflection**

Where does marginal and average costs meet?

The numerical calculations behind average cost, average variable cost, and marginal cost will change from firm to firm. However, the general patterns of these curves, and the relationships and economic intuition behind them, will not change.

# Session Review

## 6.1 discuss production cost

Cost of production refers to the monetary value of the inputs used in production process. 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 fixed inputs.

Cost can either be explicit or implicit:

- **Explicit costs** are out of pocket expenses incurred by a firm; they involve the expenditure.
- **Implicit costs** are opportunity costs of using resources that are already owned by the firm.

## 6.2 discuss different concepts of cost in relation to time Horizon in cost of production

In a short-run perspective, a firm total costs can be divided into fixed costs, which a firm must incur before producing any output, and variable costs, which the firm incurs in the act of producing.

- Fixed costs are sunk costs; that is, because they are in the past and cannot be altered, they should play no role in economic decisions about future production or pricing.
- Variable costs typically show diminishing marginal returns, so that the marginal cost of producing higher levels of output rises.

Marginal cost is calculated by taking the change in total cost (or the change in variable cost, which will be the same thing) and dividing it by the change in output, for each possible change in output. Marginal costs are typically rising.

A firm can compare marginal cost to the additional revenue it gains from selling another unit to find out whether its marginal unit is adding to profit.

Average costs are typically U-shaped on a graph. If a firm's average cost of production is lower than the market price, a firm will be earning profits.

- Average total cost is calculated by taking total cost and dividing by total output at each different level of output.
- Average variable cost is calculated by taking variable cost and dividing by the total output at each level of output.

In the long run, firms can choose their production technology, and so all costs become variable costs. In making this choice, firms will try to substitute relatively inexpensive inputs for relatively expensive inputs where possible, so as to produce at the lowest possible long-run average cost.

- Economies of scale refers to a situation where as the level of output increases, the average cost decreases.
- Constant returns to scale refers to a situation where average cost does not change as output increases.
- Diseconomies of scale refers to a situation where as output increases, average costs increase also.

### Key terms that I've discovered

. . .

# Assessment

**SAQ 6.1 (tests Learning Outcome 6.1)**

In production, you must incur some costs; costs like the purchase of factors of production, raw materials, Transportation, and so on. What is this cost called in Economics.

**SAQ 6.2 (tests Learning Outcome 6.2)**

A long run in Economics is a time long enough for a firm to vary all its fixed factors of production. In your own words, describe what you understand by short-run**.**

**SAQ 6.3 ( test Learning Outcome 6.3)**

As a producer, what will you consider to be your Total Cost, Total Fixed Cost, Average Cost and Marginal Cost? Explain each of the concept.

# Resources

**Articulate Presentation**

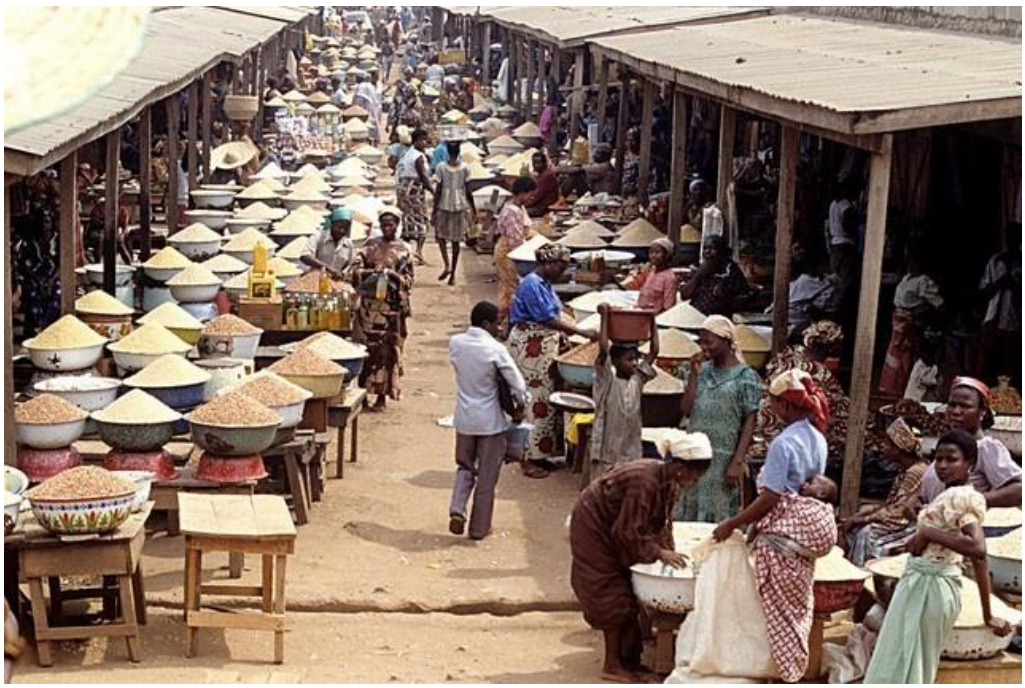
This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 7

# Introduction to Perfect Competition



**Sellers at a competitive market sells averagely the same product types** | @Bodija market, Ibadan, traders selling foodstuffs (Gari, Beans, Palm oil etc)

## INTRODUCTION

In this study session, we will examine the world of perfect competition; how they make output decision, how they determine profit and how they react to losses and profits.

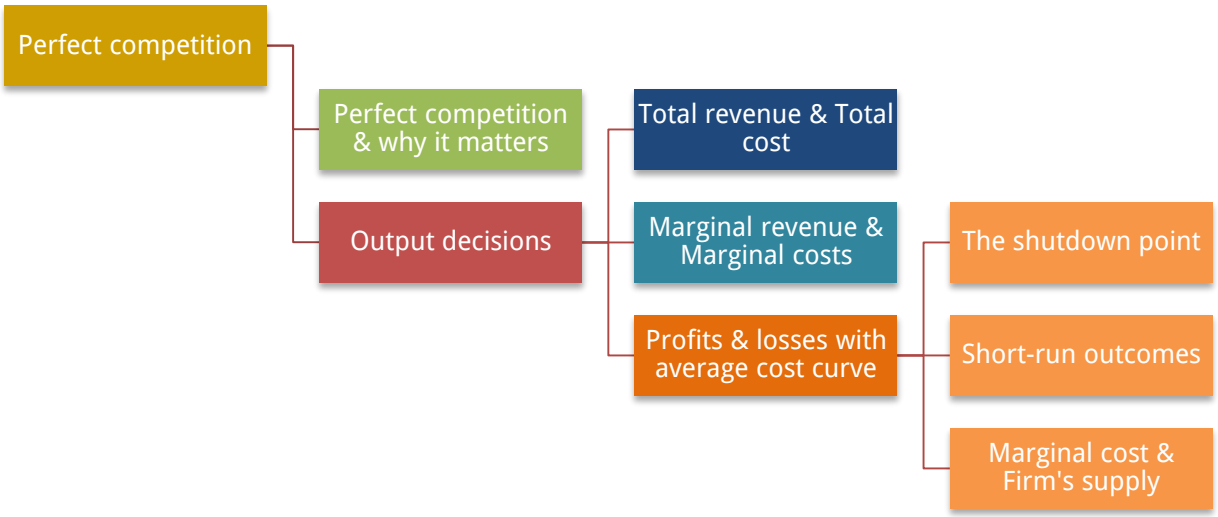
### Learning Outcomes

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

7.1 *point out* the characteristics of perfect competition

7.2 *show* how a perfectly competitive firm make output decision and determine highest profit

## Study Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| **Allocative Efficiency** | A state of the economy in which production represents consumer preferences; in particular, every good or service is produced up to the point where the last unit provides a marginal benefit to consumers equal to the marginal cost of producing. |
| **Marginal cost** | The extra cost for producing additional unit. |
| **Marginal Revenue curve** | The curve represents the extra revenue that accrues from selling one more unit. |
| **Perfect competition** | A market situation whereby there are many buyers and many independent sellers for the product. |
| **Productive Efficiency** | Concerned with producing goods and services with the optimal combination of inputs to produce maximum output for the minimum cost. |

# 7.1 PERFECT COMPETITION AND WHY IT MATTERS

All businesses face two realities: no one is required to buy their products, and even customers who might want those products may buy from other businesses instead. Firms that operate in perfectly competitive markets face this reality. In this study session, you will learn how such firms make decisions about how much to produce, how much profit they make, whether to stay in business or not, and many others. Industries differ from one another in terms of how many sellers there are in a specific market, how easy or difficult it is for a new firm to enter, and the type of products that are sold. This is referred to as the market structure of the industry. Here, we will focus on perfect competition.

Firms are said to be in perfect competition when the following conditions occur:

1. Many firms produce identical products
2. Many buyers are available to buy the product, and many sellers are available to sell the product;
3. Sellers and buyers have all relevant information to make rational decisions about the product being bought and sold;
4. Firms can enter and leave the market without any restrictions—in other words, there is free entry and exit into and out of the market.

A perfectly competitive firm is known as a price taker, because the pressure of competing firms forces them to accept the prevailing equilibrium price in the market. If a firm in a perfectly competitive market raises the price of its product by so much as a penny, it will lose all of its sales to competitors. When a beans grower, wants to know what the going price of beans is, he or she has to go to the computer or listen to the radio to check. The market price is determined solely by supply and demand in the entire market and not the individual farmer. Also, a perfectly competitive firm must be a very small player in the overall market, so that it can increase or decrease output without noticeably affecting the overall quantity supplied and price in the market.

## Self-check

**Question True/False**

- A perfectly competitive firm is a price taker.

**Feedback**

- The correct option is "true". A perfectly competitive firm is known as a price taker, because the pressure of competing firms forces them to accept the prevailing equilibrium price in the market.

A **perfectly competitive market** is a hypothetical extreme; however, producers in a number of industries do face many competitor firms selling highly similar goods, in which case they must often act as price takers. We shall be examining how a profit-

**Perfectly competitive market**

A hypothetical market where competition is at its greatest possible level.

seeking firms decide how much to produce in perfectly competitive markets. *In the short run, the perfectly competitive firm will seek the quantity of output where profits are highest or, if profits are not possible, where losses are lowest.* In this example, the "short run" refers to a situation in which firms are producing with one fixed input and incur fixed costs of production. (In the real world, firms can have many fixed inputs.) *In the long run, perfectly competitive firms will react to profits by increasing production.* They will respond to losses by reducing production or exiting the market. Ultimately, a long-run equilibrium will be attained when no new firms want to enter the market and existing firms do not want to leave the market, as economic profits have been driven down to zero.

**Tip**

In a perfectly competitive market:

- There are many buyers and sellers, so each buyer or seller is a price taker.
- All sellers supply the same, identical product.
- If a perfectly competitive firm attempts to charge even a tiny amount more than the market price, it will be unable to make any sales.

## Focus: The Advantages of Competition in Nigeria – Telecommunication Industry


Before 2001, NITEL succeeded in providing only 400,000 lines for a population of over 150 million, after several donkey years of existence. At the onset, when GSM was introduced into Nigeria, truthfully only the rich could afford it. The poor and the middle class actually had to use-up their entire savings to purchase one. During this period, since the nation was still bound with the psychological chain and fetters of a comatose telecom system, we all felt it was ok to be charged N100 an equivalent of $0.62 for a call of sixty plus one seconds. In the usual suffering and smiling Nigerian culture, customers paid per minute, and in cases when you don't use up a whole minute, mathematically you dash away money for service that was never rendered. In fact, Nigerian would remember that MTN at some point said that "per second billing was absolutely impossible." Well, it only took the advent of Globacom to realize that that wasn't just a lousy joke; it was also a big lie. A market lie!

Today, the onetime luxury of the wealthy, only accessible to the rich few has become the executive toy of all and sundry. Now that all telecom providers have to strive amidst healthy competition, prices of both GSM lines and call rates have drastically fallen. Lines that were sold for ₦20,000 in 2001 are now being sold for a giveaway prize of ₦100 and sometimes for free with several value added benefits. Sure you'd agree that a whopping 19,900% decrease in prize in every sense signifies a reduction in cost of living. And today, Nigerians are having a swell time seeing the telecoms giants falling over themselves with the "I don port" drama.

Adapted from : Lanre Olagunju tweets from @Lanre_Olagunju

# 7.2 HOW PERFECTLY COMPETITIVE FIRMS MAKE OUTPUT DECISIONS

A perfectly competitive firm has only one major decision to make namely, what quantity to produce. To understand why this is so, consider a different way of writing out the basic definition of profit:

$$\begin{aligned} Profit &= Total\ revenue - Total\ cost \\ &= (Price)\ (Quantity\ produced) \\ &- (Average\ cost)\ (Quantity\ produced) \end{aligned}$$

Since a perfectly competitive firm must accept the price for its output as determined by the product's market demand and supply, it cannot choose the price it charges. This is already determined in the profit equation, and so the perfectly competitive firm can sell any number of units at exactly the same price. It implies that the firm faces a perfectly elastic demand curve for its product: buyers are willing to buy any number of units of output from the firm at the market price. When the perfectly competitive firm chooses what quantity to produce, then this quantity—along with the prices prevailing in the market for output and inputs—will determine the firm's total revenue, total costs, and ultimately, level of profits.

## DETERMINING THE HIGHEST PROFIT BY COMPARING TOTAL REVENUE AND TOTAL COST

A perfectly competitive firm can sell as large a quantity as it wishes, as long as it accepts the prevailing market price. Total revenue is going to increase as the firm sells more, depending on the price of the product and the number of units sold. If you increase the number of units sold at a given price, then total revenue will increase. If the price of the product increases for every unit sold, then total revenue also increases.

Based on its total revenue and total cost curves, a perfectly competitive firm can calculate the quantity of output that will provide the highest level of profit. At any given quantity, total revenue minus total cost will equal profit. One way to determine the most profitable quantity to produce is to see at what quantity total revenue exceeds total cost by the largest amount.

A higher price would mean that total revenue would be higher for every quantity sold. A lower price would mean that total revenue would be lower for every quantity sold. What happens if the price drops low enough so that the total revenue line is completely below the total cost curve; that is, at every level of output, total costs are higher than total revenues? In this instance, the best the firm can do is to suffer losses. But a profit-maximizing firm will prefer the quantity of output where total revenues come closest to total costs and thus where the losses are smallest.

## Comparing Marginal Revenue and Marginal Costs

Firms often do not have the necessary data they need to draw a complete total cost curve for all levels of production. They cannot be sure of what total costs would look like if they, say, doubled production or cut production in half, because they have not tried it. Instead, firms experiment. They produce a slightly greater or lower quantity and observe how profits are affected. In economic terms, this practical approach to maximizing profits means looking at how changes in production affect marginal revenue and marginal cost.

Since a perfectly competitive firm is a price taker, it can sell whatever quantity it wishes at the market-determined price. **Marginal cost**, the cost per additional unit sold, is calculated by dividing the change in total cost by the change in quantity. The formula for marginal cost is:

$$Marginal\ cost\ =\ change\ in\ total\ cost\ /\ change\ in\ quantity$$

Ordinarily, marginal cost changes as the firm produces a greater quantity. Marginal cost will first decline as production increases, then starts to increase, displaying the typical pattern of diminishing marginal returns. If a firm is producing at a quantity where MR > MC, then it can increase profit by increasing output because the marginal revenue is exceeding the marginal cost. If a firm is producing at a quantity where MC > MR, then it can increase profit by reducing output because the reductions in marginal cost will exceed the reductions in marginal revenue. The firm's profit-maximizing choice of output will occur where MR = MC (or at a choice close to that point). You will notice that what occurs on the production side is exemplified on the cost side. This is referred to as duality.

The profit-maximizing choice for a perfectly competitive firm will occur where marginal revenue is equal to marginal cost—that is, where MR = MC. A profit-seeking firm should keep expanding production as long as MR > MC. But at the level of output where MR = MC, the firm should recognize that it has achieved the highest possible level of economic profits. Expanding production into the zone where MR < MC will only reduce economic profits. Because the marginal revenue received by a perfectly competitive firm is equal to the price P, so that P = MR, the profit-maximizing rule for a perfectly competitive firm can also be written as a recommendation to produce at the quantity where P = MC.

**Marginal cost**

The cost added for producing one extra unit of a product.

**SELF-CHECK**

**Question**

- Which curve shows the additional revenue gained from selling one more unit?

A. Marginal revenue
B. Total revenue
C. Sales

**Feedback**

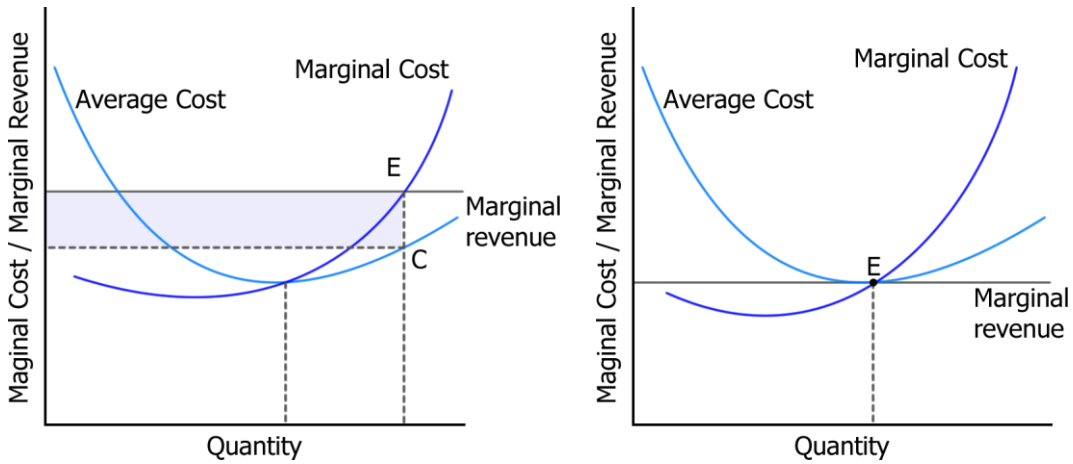
- Option A is valid, marginal revenue curve shows the change in total revenue resulting from increases in total sales by one unit per period of time

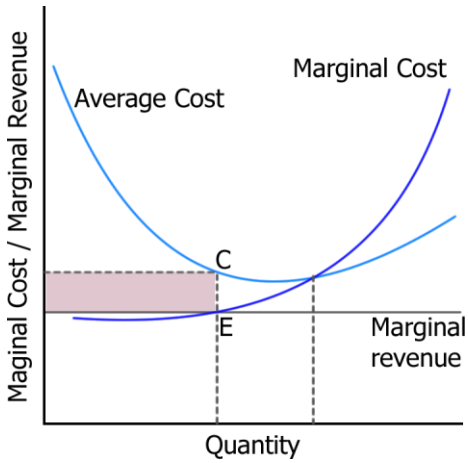
# PROFITS AND LOSSES WITH THE AVERAGE COST CURVE

Does maximizing profit (producing where MR = MC) imply an actual economic profit? The answer depends on the relationship between price and average total cost. If the price that a firm charges is higher than its average cost of production for that quantity produced, then the firm will earn profits. Conversely, if the price that a firm charges is lower than its average cost of production, the firm will suffer losses. You might think that, in this situation, the farmer may want to shut down immediately. Remember, however, that the firm has already paid for fixed costs, such as equipment, so it may continue to produce and incur a loss.

a. Where price intersects marginal cost at a level above the average cost curve,
b. Where price intersects marginal cost at a level equal to the average cost curve, and
c. Where price intersects marginal cost at a level below the average cost curve.

Figure 7.1: Profit and loss curves






If the market price received by a perfectly competitive firm leads it to produce at a quantity where the price is greater than average cost, the firm will earn profits. If the price received by the firm causes it to produce at a quantity where price equals average cost, which occurs at the minimum point of the AC curve, then the firm earns zero profits.

Finally, if the price received by the firm leads it to produce at a quantity where the price is less than average cost, the firm will earn losses. This is summarized in Table 7.1.

**Table 7.1 How a firm makes profits and losses**

| If... | Then... |
|---|---|
| Price > ATC | Firm earns an economic profit |
| Price = ATC | Firm earns zero economic profit |
| Price < ATC | Firm earns a loss |

## The Shutdown Point

The possibility that a firm may earn losses raises a question: Why can the firm not avoid losses by shutting down and not producing at all? The answer is that shutting down can reduce variable costs to zero, but in the short run, the firm has already paid for fixed costs. As a result, if the firm produces a quantity of zero, it would still make losses because it would still need to pay for its fixed costs. So, when a firm is experiencing losses, it must face a question: should it continue producing or should it shut down?

*Examine the scenario below, if you are the owner of a gym center, when will you shut down?*

As an example, consider the situation of the Gym Center, which has signed a contract to rent space that costs ₦10000 per month. If the firm decides to operate, its marginal costs for hiring gym teachers is ₦15, 000 for the month. If the firm shuts down, it must still pay the rent, but it would not need to hire labor. The table below shows three possible scenarios. In the first scenario, the Gym Center does not have any clients, and therefore does not make any revenues, in which case it faces losses of ₦10, 000 equal to the fixed costs. In the second scenario, the Gym Center has clients that earn the center revenues of ₦10, 000 for the month, but ultimately experiences losses of ₦15, 000 due to having to hire gym instructors to cover the classes. In the third scenario, the Gym Center earns revenues of ₦20, 000 for the month, but experiences losses of ₦5, 000.

In all three cases, the Gym Center loses money. In all three cases, when the rental contract expires in the long run, assuming revenues do not improve, the firm should exit this business. In the short run, though, the decision varies depending on the level of losses and whether the firm can cover its variable costs. In scenario 1, the center does not have any revenues, so hiring gym teachers would increase variable costs and losses, so it should shut down and only incur its fixed costs. In scenario 2, the center's losses are greater because it does not make enough revenue to offset the increased variable costs plus fixed costs, so it should shut down immediately. If price is below the minimum average variable cost, the firm must shut down. In contrast, in

scenario 3 the revenue that the center can earn is high enough that the losses diminish when it remains open, so the center should remain open in the short run.

**Discussion**

Scenario 1

If the center shuts down now, revenues are zero but it will not incur any variable costs and would only need to pay fixed costs of N10, 000.

$$Profit = Total\ revenue - (fixed\ costs + variable\ cost) = 0 - N10,000 = N10,000$$

Scenario 2

The center earns revenues of N10, 000, and variable costs are N15, 000. The center should shut down now.

$$Profit = Total\ revenue - (fixed\ costs + variable\ cost)$$
$$= N10,000 - (N10,000 + N15,000) = -N15,000$$

Scenario 3

The center earns revenues of N20, 000, and variable costs are N15, 000. The center should continue in Business.

$$Profit = total\ revenue - (fixed\ costs + variable\ cost)$$
$$= N20,000 - (N10,000 + N15,000) = -N5,000$$

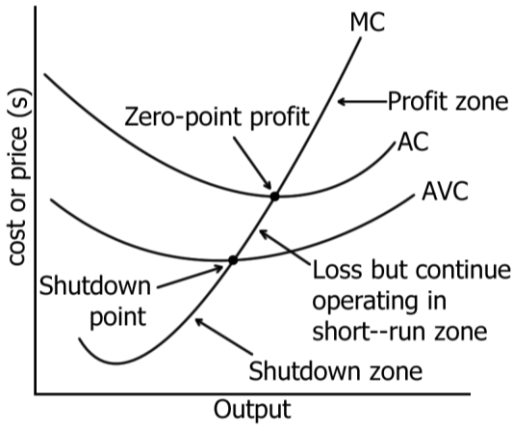
The intersection of the average variable cost curve and the marginal cost curve, which shows the price where the firm would lack enough revenue to cover its variable costs, is called the shutdown point. If the perfectly competitive firm can charge a price above the shutdown point, then the firm is at least covering its average variable costs. It is also making enough revenue to cover at least a portion of fixed costs, so it should limp ahead even if it is making losses in the short run, since at least those losses will be smaller than if the firm shuts down immediately and incurs a loss equal to total fixed costs. However, if the firm is receiving a price below the price at the shutdown point, then the firm is not even covering its variable costs. In this case, staying open is making the firm's losses larger, and it should shut down immediately. To summarize, if:

i. Price < minimum average variable cost, then firm shuts down
ii. Price = minimum average variable cost, then firm stays in business

## Short-Run Outcomes for Perfectly Competitive Firms

The average cost and average variable cost curves divide the marginal cost curve into three segments, as shown in Figure 7.2. At the market price, which the perfectly competitive firm accepts as given, the profit-maximizing firm chooses the output level where price or marginal revenue, which are the same thing for a perfectly competitive firm, is equal to marginal cost: P = MR = MC.

Figure *7.2* Profit, loss, shutdown




The marginal cost curve can be divided into three zones, based on where it is crossed by the average cost and average variable cost curves. The point where MC crosses AC is called the zero profit point. If the firm is operating at a level of output where the market price is at a level higher than the zero-profit point, then price will be greater than average cost and the firm is earning profits. If the price is exactly at the zero profit point, then the firm is making zero profits. If price falls in the zone between the shutdown point and the zero profit point, then the firm is making losses but will continue to operate in the short run, since it is covering its variable costs. However, if price falls below the price at the shutdown point, then the firm will shut down immediately, since it is not even covering its variable costs.

First consider the upper zone, where prices are above the level where marginal cost (MC) crosses average cost (AC) at the zero profit point. At any price above that level, the firm will earn profits in the short run. If the price falls exactly on the zero profit point where the MC and AC curves cross, then the firm earns zero profits. If a price falls into the zone between the zero profit point, where MC crosses AC, and the shutdown point, where MC crosses AVC, the firm will be making losses in the short run—but since the firm is more than covering its variable costs, the losses are smaller than if the firm shut down immediately. Finally, consider a price at or below the shutdown point where MC crosses AVC. At any price like this one, the firm will shut down immediately, because it cannot even cover its variable costs.

## Marginal Cost and the Firm's Supply Curve

For a perfectly competitive firm, the marginal cost curve is identical to the firm's supply curve starting from the minimum point on the average variable cost curve. To understand why this perhaps surprising insight holds true, first think about what the supply curve means. A firm checks the market price and then looks at its supply curve to decide what quantity to produce. Now, think about what it means to say that a firm will maximize its profits by producing at the quantity where P = MC. This rule means that the firm checks the market price, and then looks at its marginal cost to determine the quantity to produce—and makes sure that the price is greater than the minimum average variable cost. In other words, the marginal cost curve above the minimum point on the average variable cost curve becomes the firm's supply curve.

**Note**

As discussed in the Study Session on Demand and Supply, many of the reasons that supply curves shift relate to underlying changes in costs. For example, a lower price of key inputs or new technologies that reduce production costs cause supply to shift to the right; in contrast, bad weather or added government regulations can add to costs of certain goods in a way that causes supply to shift to the left. These shifts in the firm's supply curve can also be interpreted as shifts of the marginal cost curve. A shift in costs of production that increases marginal costs at all levels of output—and shifts MC to the left—will cause a perfectly competitive firm to produce less at any given market price. Conversely, a shift in costs of production that decreases marginal costs at all levels of output will shift MC to the right and as a result, a competitive firm will choose to expand its level of output at any given price.

**SELF-CHECK**

**Question (True / False)**

- Each economic agent in a perfectly competitive system is a price giver.

**Feedback**

- False. As a matter of fact, all the economic agents in a perfectly competitive structure are price takers. Let's not forget that perfectly competitive system deal with homogenous products. There are large number of buyers and sellers such that each economic agent action does not necessarily have any appreciably impact on the market price.

## Efficiency in Perfectly Competitive Markets

When profit-maximizing firms in perfectly competitive markets combine with utility-maximizing consumers, something remarkable happens: the resulting quantities of outputs of goods and services demonstrate both productive and allocative efficiency. Productive efficiency means producing without waste, so that the choice is on the production possibility frontier. In the long run in a perfectly competitive market, because of the process of entry and exit, the price in the market is equal to the minimum of the long-run average cost curve. In other words, goods are being produced and sold at the lowest possible average cost.

Allocative efficiency means that among the points on the production possibility frontier, the point that is chosen is socially preferred—at least in a particular and specific sense. In a perfectly competitive market, price will be equal to the marginal cost of production. Think about the price that is paid for a good as a measure of the social benefit received for that good; after all, willingness to pay conveys what the good is worth to a buyer. Then think about the marginal cost of producing the good as representing not just the cost for the firm, but more broadly as the social cost of producing that good. When perfectly competitive firms follow the rule that profits are maximized by producing at the quantity where price is equal to marginal cost, they are thus ensuring that the social benefits received from producing a good are in line with the social costs of production.

To explore what is meant by allocative efficiency, it is useful to walk through an example. Begin by assuming that the market for wholesale flowers is perfectly competitive, and so P = MC. Now, consider what it would mean if firms in that market produced a lesser quantity of flowers. At a lesser quantity, marginal costs will not yet have increased as much, so that price will exceed marginal cost; that is, P > MC. In that situation, the benefit to society as a whole of producing additional goods, as measured by the willingness of consumers to pay for marginal units of a good, would be higher than the cost of the inputs of labor and physical capital needed to produce the marginal good. In other words, the gains to society as a whole from producing additional marginal units will be greater than the costs.

Conversely, consider what it would mean if, compared to the level of output at the allocatively efficient choice when P = MC, firms produced a greater quantity of flowers. At a greater quantity, marginal costs of production will have increased so that P < MC. In that case, the marginal costs of producing additional flowers is greater than the benefit to society as measured by what people are willing to pay. For society as a whole, since the costs are outstripping the benefits, it will make sense to produce a lower quantity of such goods.

When perfectly competitive firms maximize their profits by producing the quantity where P = MC, they also assure that the benefits to consumers of what they are buying, as measured by the price they are willing to pay, is equal to the costs to society of producing the marginal units, as measured by the marginal costs the firm must pay—and thus that allocative efficiency holds.

The statements that a perfectly competitive market in the long run will feature both productive and allocative efficiency do need to be taken with a few grains of salt. Remember, economists are using the concept of "efficiency" in a particular and specific sense, not as a synonym for "desirable in every way." For one thing, consumers' ability to pay reflects the income distribution in a particular society. Thus, a homeless person may have no ability to pay for housing because they have insufficient income.

**Tip**

Perfect competition, in the long run, is a hypothetical benchmark. For market structures such as monopoly, monopolistic competition, and oligopoly, which are more frequently observed in the real world than perfect competition, firms will not always produce at the minimum of average cost, nor will they always set price equal to marginal cost. Thus, these other competitive situations will not produce productive and allocative efficiency.

Moreover, real-world markets include many issues that are assumed away in the model of perfect competition, including pollution, inventions of new technology, poverty which may make some people unable to pay for basic necessities of life, government programs like national defense or education, discrimination in labor markets, and buyers and sellers who must deal with imperfect and unclear information. However, the theoretical efficiency of perfect competition does provide a useful benchmark for comparing the issues that arise from these real-world problems.

# Session Review

### 7.1 point out the characteristics of Perfect competition

Perfect competition means that there are many sellers, easy entry, and identical products. A perfectly competitive firm is a price taker, it accepts the equilibrium price at which it sells goods.

### 7.2 show how a Perfectly Competitive firm make output decision and determine highest profit

As a perfectly competitive firm produces a greater quantity of output, its total revenue steadily increases at a constant rate determined by the given market price. Profits will be highest (or losses will be smallest) at the quantity of output where total revenues exceed total costs by the greatest amount (or where total revenues fall short of total costs by the smallest amount). Alternatively, profits will be highest where marginal revenue, which is price for a perfectly competitive firm, is equal to marginal cost.

- If the market price faced by a perfectly competitive firm is above average cost at the profit-maximizing quantity of output, then the firm is making profits. If the market price is below average cost at the profit-maximizing quantity of output, then the firm is making losses.
- If the market price is equal to average cost at the profit-maximizing level of output, then the firm is making zero profits. The point where the marginal cost curve crosses the average cost curve, at the minimum of the average cost curve, is called the zero profit point.
- If the market price faced by a perfectly competitive firm is below average variable cost at the profit-maximizing quantity of output, then the firm should shut down operations immediately.
- If the market price faced by a perfectly competitive firm is above average variable cost, but below average cost, then the firm should continue producing in the short run, but exit in the long run. The point where the marginal cost curve crosses the average variable cost curve is called the shutdown point.

### Key terms that I've discovered

. . .

# Assessment

**SAQ 7.1 (tests Learning Outcome 7.1)**

In Uromi market, you have many buyers and many independent sellers. In Economics, what type of market structure is Uromi Market?

**SAQ 7.2 (tests Learning Outcome 7.2)**

1. A perfectly competitive firm is a price taker, what then does it do to maximise profit?
2. If Marginal cost is the cost per unit sold, what Marginal Revenue?
3. If Average total cost is less than price, what happens to the firm?
   The firm will not make profit when Average total cost is greater than price. Yes or No?
4. In reference to the example in study session 7.5.1, when do you consider the Gym centre to have shut down?

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 8

# Introduction to Monopoly


OPEC Headquaters, Vienna (www.foreignaffairs.com)

## INTRODUCTION

We have discussed what a perfect competition firm looks like in the last study session. In this study session, however, we shall be discussing the Monopoly (the opposite of monopoly), how they are formed and how they decide output in order to make profit.

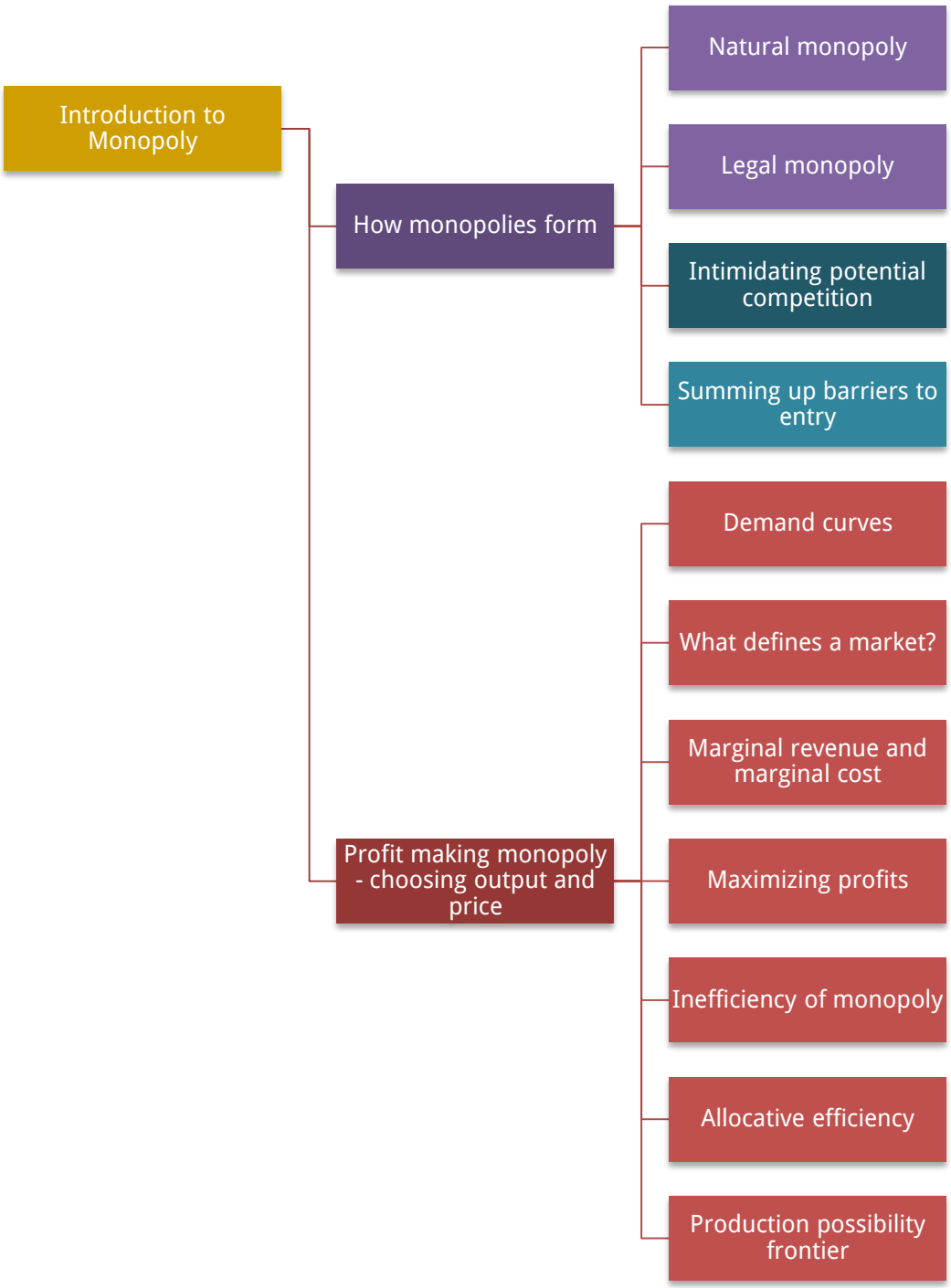
### Learning Outcomes

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

8.1 *explain* how monopolies are formed

8.2 *discuss* how a profit-maximising monopoly choose output and price

## Study Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| Copyright | The exclusive and assignable legal right, given to the originator for a fixed number of years, to print, publish, perform, film, or record literary, artistic, or musical material. |
| Monopoly | The exclusive possession or control of the supply of or trade in a commodity or service. |
| Natural monopolies | A type of monopoly that exists as a result of the high fixed costs or startup costs of operating a business in a specific industry. |
| Patent | A government authority or license conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention. |
| Trademark | A symbol, word, or words legally registered or established by use as representing a company or product. |

# 8.1 HOW MONOPOLIES FORM

There is a widespread belief that top executives at firms are the strongest supporters of market competition, but this belief is far from the truth. Think about it this way: If you very much wanted to win an Olympic gold medal, would you rather be far better than everyone else, or locked in competition with many athletes just as good as you are? Similarly, if you would like to attain a very high level of profits, would you rather manage a business with little or no competition, or struggle against many tough competitors who are trying to sell to your customers? By now, you might have read the study session on Perfect Competition. In this session, we explore the opposite extreme: monopoly. If perfect competition is a market where firms have no market power and they simply respond to the market price, monopoly is a market with no competition at all, and firms have complete market power. In the case of monopoly, one firm produces all of the output in a market. Since a monopoly faces no significant competition, it can charge any price it wishes. While a monopoly, by definition, refers to a single firm, in practice the term is often used to describe a market in which one firm merely has a very high market share.

Even though there are very few true monopolies in existence, we do deal with some of those few every day, often without realizing it: The Power Holdings Company of Nigeria, Postal Service, and garbage collection companies are a few examples. Some new drugs are produced by only one pharmaceutical firm—and no close substitutes for that drug may exist.

Because of the lack of competition, monopolies tend to earn significant economic profits. These profits should attract vigorous competition as described in Perfect Competition, and yet, because of one particular characteristic of monopoly, they do not.

Barriers to entry can range from the simple and easily surmountable, such as the cost of renting retail space, to the extremely restrictive. For example, there are a finite number

of radio frequencies available for broadcasting. Once the rights to all of them have been purchased, no new competitors can enter the market.

In some cases, barriers to entry may lead to monopoly. In other cases, they may limit competition to a few firms. Barriers may block entry even if the firm or firms currently in the market are earning profits. Thus, in markets with significant barriers to entry, it is not true that abnormally high profits will attract new firms, and that this entry of new firms will eventually cause the price to decline so that surviving firms earn only a normal level of profit in the long run.

**Self-Check**

**Question (True / False)**

- In monopoly, there is no distinction between the firm and the industry.

**Feedback**

- True, a monopoly is the only producer in an industry.

**Tip**

Barriers to entry are the legal, technological, or market forces that discourage or prevent potential competitors from entering a market

There are two types of monopoly, based on the types of barriers to entry they exploit. One is natural monopoly, where the barriers to entry are something other than legal prohibition. The other is legal monopoly, where laws prohibit (or severely limit) competition.

## 8.1.1 Natural Monopoly

**Natural Monopoly**

Arises where the largest supplier in an industry, often the first supplier in a market, has an overwhelming cost advantage over other actual or potential competitors.

**Legal Monopoly**

Offers a specific product or service at a regulated price and can either be independently run and government regulated, or government run and regulated.

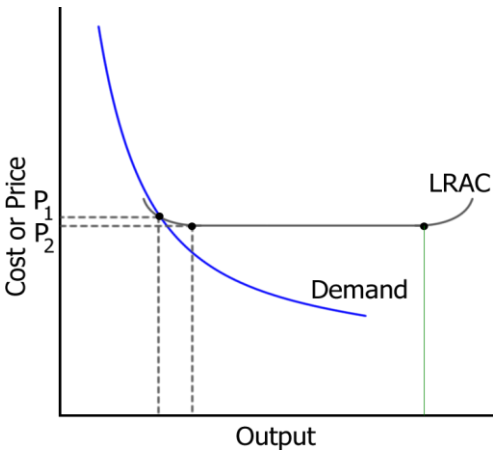
A **natural monopoly** occurs when the quantity demanded is less than the minimum quantity it takes to be at the bottom of the long-run average cost curve. This situation, when economies of scale are large relative to the quantity demanded in the market, is called a natural monopoly. Natural monopolies often arise in industries where the marginal cost of adding an additional customer is very low, once the fixed costs of the overall system are in place. Once the main water pipes are laid through a neighbourhood, the marginal cost of providing water service to another home is fairly low. Once electricity lines are installed through a neighbourhood, the marginal cost of providing additional electrical service to one more home is very low. It would be costly and duplicative for a second water company to enter the market and invest in a whole second set of main water pipes, or for a second electricity company to enter the market and invest in a whole new set of electrical wires. These industries offer an example where, because of economies of scale, one producer can serve the entire market more efficiently than a number of smaller producers that would need to make duplicate physical capital investments.

A natural monopoly can also arise in smaller local markets for products that are difficult to transport. For example, cement production exhibits economies of scale, and the quantity of cement demanded in a local area may not be much larger than what a single plant can produce. Moreover, the costs of transporting cement over land are high, and so a cement plant in an area without access to water transportation may be a natural monopoly.

## 8.1.2 Legal Monopoly

For some products, the government erects barriers to entry by prohibiting or limiting competition. Many states or cities have laws or regulations that allow households a choice of only one electric company, one water company, and one company to pick up the garbage. Most legal monopolies are considered utilities—products necessary for everyday life—that are socially beneficial to have. As a consequence, the government allows producers to become regulated monopolies, to insure that an appropriate amount of these products is provided to consumers. Such a situation is ascribed **legal monopoly**. Additionally, legal monopolies are often subject to economies of scale, so it makes sense to allow only one provider.

Figure 8.1: Legal monopoly curve




### Promoting Innovation

Innovation takes time and resources to achieve. Suppose a company invests in research and development and finds the cure for the common cold. In this world of near ubiquitous information, other companies could take the formula, produce the drug, and because they did not incur the costs of research and development (R&D), undercut the price of the company that discovered the drug. Given this possibility, many firms would choose not to invest in research and development, and as a result, the world would have less innovation.

#### A trademark

This is an identifying symbol or name for a particular good, like Chiquita bananas, Chevrolet cars, or the Nike "swoosh" that appears on shoes and athletic gear. A firm can renew a trademark over and over again, as long as it remains in active use.

**Trademark**

A word, phrase, symbol, and/or design that identifies and distinguishes the source of the goods of one party from those of others.

**Copyright**

A legal right created by the law of a country that grants the creator of an original work exclusive rights for its use and distribution.

### *A copyright*

This is a form of protection for original works of authorship including literary, dramatic, musical, architectural, cartographic, choreographic, pantomimic, pictorial, graphic, sculptural, and audio-visual creations." No one can reproduce, display, or perform a copyrighted work without permission of the author. Copyright protection ordinarily lasts for the life of the author plus 70 years.

Roughly speaking, patent law covers inventions and copyright protects books, songs, and art. But in certain areas, like the invention of new software, it has been unclear whether patent or copyright protection should apply. There is also a body of law known as trade secrets. Even if a company does not have a patent on an invention, competing firms are not allowed to steal their secrets. One famous trade secret is the formula for Coca-Cola, which is not protected under copyright or patent law, but is simply kept secret by the company.

Taken together, this combination of patents, trademarks, copyrights, and trade secret law is called intellectual property, because it implies ownership over an idea, concept, or image, not a physical piece of property like a house or a car. Countries around the world have enacted laws to protect intellectual property, although the time periods and exact provisions of such laws vary across countries. There are ongoing negotiations, both through the World Intellectual Property Organization (WIPO) and through international treaties, to bring greater harmony to the intellectual property laws of different countries to determine the extent to which patents and copyrights in one country will be respected in other countries.

What products are considered utilities depend, in part, on the available technology. About twenty years ago, local and long distance telephone service was provided over wires. It did not make much sense to have multiple companies building multiple systems of wiring across towns and across the country. NITEL lost its monopoly on long distance service when the technology for providing phone service changed from wires to microwave and satellite transmission, so that multiple firms could use the same transmission mechanism. The same thing happened to local service, especially in recent years, with the growth in cellular phone systems.

The combination of improvements in production technologies and a general sense that the markets could provide services adequately led to a wave of deregulation. This wave eliminated or reduced government restrictions on the firms that could enter, the prices that could be charged, and the quantities that could be produced in many industries, including telecommunications, airlines, trucking, banking, and electricity.

Around the world, from Africa to Europe to Latin America and Asia, many governments continue to control and limit competition in what those governments perceive to be key industries, including airlines, banks, steel companies, oil companies, and telephone companies.

**SELF-CHECK**

**Question**

- Which of the forms of monopoly arises in industries where the marginal cost of adding an additional customer is very low once the fixed costs of the overall system are in place.
  A. Legal Monopoly
  B. Natural Monopoly

**Feedback**

- The correct answer is (a). Natural Monopoly occur when a single firm can supply a good or service to an entire market at a smaller cost than could two or more firms.

## 8.1.3 Intimidating Potential Competition

Businesses have developed a number of schemes for creating barriers to entry by deterring potential competitors from entering the market. One method is known as predatory pricing, in which a firm uses the threat of sharp price cuts to discourage competition. **Predatory pricing** is a violation of many countries' antitrust law, but it is difficult to prove.

Consider a large airline that provides most of the flights between two particular cities. A new, small start-up airline decides to offer service between these two cities. The large airline immediately slashes prices on this route to the bone, so that the new entrant cannot make any money. After the new entrant has gone out of business, the incumbent firm can raise prices again. After this pattern is repeated once or twice, potential new entrants may decide that it is not wise to try to compete.

In some cases, large advertising gadgets can also act as a way of discouraging the competition. If the only way to launch a successful new national cola drink is to spend more than the promotional budgets of Coca-Cola and Pepsi Cola, not too many companies will try. A firmly established brand name can be difficult to dislodge.

**Predatory pricing**

An act of setting prices low in an attempt to eliminate the competition.

**SELF-CHECK**

**Question**

- _____ gives the inventor the exclusive legal right to make, use, or sell the invention for a limited time.

A. Patent
B. Copyright

**Feedback**

- Patent, this is a monopoly situation, which arises because the government has given one person or firm the exclusive right to sell some goods or services.

### Summing Up Barriers to Entry

Table 8.1 lists the barriers to entry that have been discussed here. This list is not exhaustive, since firms have proved to be highly creative in inventing business practices that discourage competition. When barriers to entry exist, perfect competition is no longer a reasonable description of how an industry works. When barriers to entry are high enough, monopoly can result.

Table 8.1 Barriers to Entry

| Barrier to Entry | Government Role? | Example |
|---|---|---|
| Natural monopoly | Government often responds with regulation (or ownership) | Water and electric companies |
| Control of a physical resource | No | DeBeers for diamonds |
| Legal monopoly | Yes | Post office, past regulation of airlines and trucking |
| Patent, trademark, and copyright | Yes, through protection of intellectual property | New drugs or software |
| Intimidating potential competitors | Somewhat | Predatory pricing; well-known brand names |

## 8.2 How a Profit-Maximizing Monopoly Chooses Output and Price

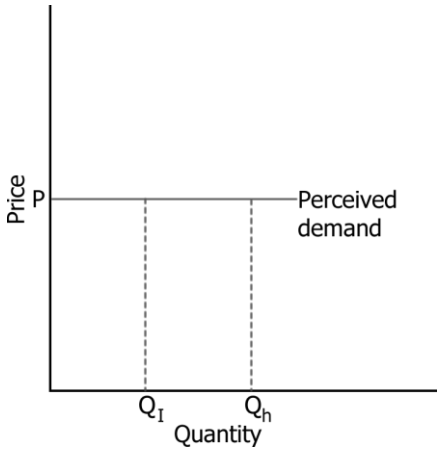
Consider a monopoly firm, comfortably surrounded by barriers to entry so that it need not fear competition from other producers. How will this monopoly choose its profit-maximizing quantity of output, and what price will it charge? Profits for the monopolist, like any firm, will be equal to total revenues minus total costs. The pattern of costs for the monopoly can be analysed within the same framework as the costs of a perfectly competitive firm—that is, by using total cost, fixed cost, variable cost, marginal cost, average cost, and average variable cost. However, because a monopoly faces no competition, its situation and its decision process will differ from that of a perfectly competitive firm.

### 8.2.1 Demand Curves Perceived by a Perfectly Competitive Firm and by a Monopoly

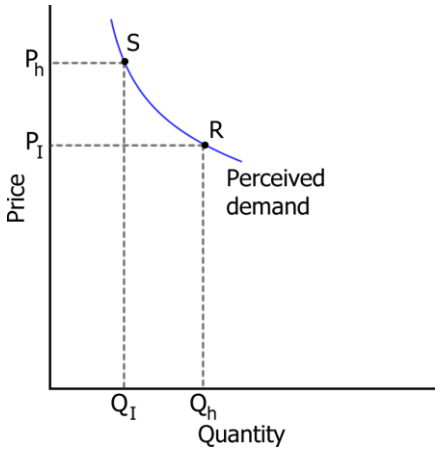
A perfectly competitive firm acts as a price taker, so its calculation of total revenue is made by taking the given market price and multiplying it by the quantity of output that the firm chooses. The demand curve as it is perceived by a perfectly competitive firm appears in Figure 8.2.

Figure 8.2: Perceived demand curve for a perfect competitor and a monopolist

A) Perceived demand for a perfect competitor




B) Perceived demand for a monopolist




i. A perfectly competitive firm perceives the demand curve that it faces to be flat. The flat shape means that the firm can sell either a low quantity ($Q_l$) or a high quantity ($Q_h$) at exactly the same price (P).

ii. A monopolist perceives the demand curve that it faces to be the same as the market demand curve, which for most goods is downward-sloping. Thus, if the monopolist chooses a high level of output ($Q_h$), it can charge only a relatively low price ($P_l$); conversely, if the monopolist chooses a low level of output ($Q_l$), it can then charge a higher price ($P_h$). The challenge for the monopolist is to choose the combination of price and quantity that maximizes profits.

**Note**

The flat perceived demand curve means that, from the viewpoint of the perfectly competitive firm, it could sell either a relatively low quantity like Ql or a relatively high quantity like Qh at the market price P.

## 8.2.2 What Defines a Market

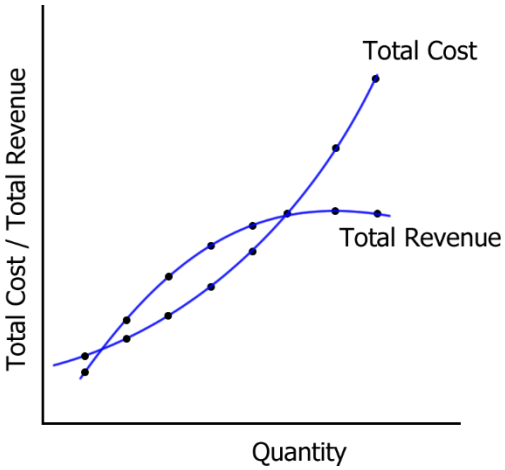
A monopoly is a firm that sells all or nearly all of the goods and services in a given market. But what defines the "market"? In general, if a firm produces a product without close substitutes, then the firm can be considered a monopoly producer in a single market. But if buyers have a range of similar—even if not identical—options available from other firms, then the firm is not a monopoly. Still, arguments over whether substitutes are close or not close can be controversial.

While a monopolist can charge any price for its product, that price is nonetheless constrained by demand for the firm's product. No monopolist, even one that is thoroughly protected by high barriers to entry, can require consumers to purchase its product. Because the monopolist is the only firm in the market, its demand curve is the same as the market demand curve, which is, unlike that for a perfectly competitive firm, downward-sloping.

**Total Cost and Total Revenue for a Monopolist**

Profits for a monopolist can be illustrated with a graph of total revenues and total costs, as shown with the example of the hypothetical HealthPill firm in Figure 8.3. The total cost curve has its typical shape; that is, total costs rise and the curve grows steeper as output increases.

Figure 8.3: Total Revenue and Total Cost for the Healthplus monopoly




Total revenue for the monopoly firm called HealthPill first rises, then falls. Low levels of output bring in relatively little total revenue, because the quantity is low. High levels of output bring in relatively less revenue, because the high quantity pushes down the market price. The total cost curve is upward-sloping. Profits will be highest at the quantity of output where total revenue is most above total cost. Of the choices in Table 8.2, the highest profits happen at an output of 4. The profit-maximizing level of output is not the same as the revenue-maximizing level of output, which should make sense, because profits take costs into account and revenues do not.

Table 8.2 Total Costs and Total Revenues of HealthPill

| QUANTITY | TOTAL COST | PRICE | TOTAL REVENUE | PROFIT (REVENUE-COST) |
|---|---|---|---|---|
| 1 | 1500 | 1200 | 1200 | -300 |
| 2 | 1800 | 1100 | 2200 | 400 |
| 3 | 2200 | 1000 | 3000 | 800 |
| 4 | 2800 | 900 | 3600 | 900 |
| 5 | 3500 | 800 | 4000 | 700 |
| 6 | 4200 | 700 | 4200 | 0 |
| 7 | 5600 | 600 | 4200 | -1400 |
| 8 | 7400 | 500 | 4000 | -3400 |

To calculate total revenue for a monopolist, start with the demand curve perceived by the monopolist. The Fig. earlier shows quantities along the demand curve and the price at each quantity demanded, and then calculates total revenue by multiplying price times quantity at each level of output. (In this example, the output is given as 1, 2, 3, 4, and so on, for the sake of simplicity. If you prefer a dash of greater realism, you can imagine that these output levels and the corresponding prices are measured per 1,000 or 10,000 pills.) As the figure illustrates, total revenue for a monopolist rises, flattens out, and then falls. In this example, total revenue is highest at a quantity of 6 or 7.

Clearly, the total revenue for a monopolist is not a straight upward-sloping line, in the way that total revenue was for a perfectly competitive firm. The different total revenue pattern for a monopolist occurs because the quantity that a monopolist chooses to produce affects the market price, which was not true for a perfectly competitive firm. If the monopolist charges a very high price, then quantity demanded drops, and so total revenue is very low. If the monopolist charges a very low price, then, even if quantity demanded is very high, total revenue will not add up to much. At some intermediate level, total revenue will be highest.

However, the monopolist is not seeking to maximize revenue, but instead to earn the highest possible profit. Profits are calculated in the final row of the table. Of the choices given in the table, the highest profits occur at an output of 4, where profit is 900.

**Self-Check**

**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

## 8.2.3 Marginal Revenue and Marginal Cost for a Monopolist

In the real world, a monopolist often does not have enough information to analyze its entire total revenues or total costs curves; after all, the firm does not know exactly what would happen if it were to alter production dramatically. But a monopolist often has fairly reliable information about how changing output by small or moderate amounts will affect its marginal revenues and marginal costs, because it has had experience with such changes over time and because modest changes are easier to extrapolate from current experience. A monopolist can use information on marginal revenue and marginal cost to seek out the profit-maximizing combination of quantity and price. A monopolist can determine its profit-maximizing price and quantity by analysing the marginal revenue and marginal costs of producing an extra unit. If the marginal revenue exceeds the marginal cost, then the firm should produce the extra unit.

Indeed, the monopoly could seek out the profit-maximizing level of output by increasing quantity by a small amount, calculating marginal revenue and marginal cost, and then

either increasing output as long as marginal revenue exceeds marginal cost or reducing output if marginal cost exceeds marginal revenue. This process works without any need to calculate total revenue and total cost. Thus, a profit-maximizing monopoly should follow the rule of producing up to the quantity where marginal revenue is equal to marginal cost—that is, MR = MC.

## Focus: Dangote gets Concessions for Cement Production

The Federal Government yesterday rolled out several incentives to an indigenous conglomerate, the Dangote Group, in its efforts to encourage Nigerians to invest locally.

The business concession is to enable the company actualise an $850 million project involving the establishment of cement production plants in three locations in Nigeria. Minister of Transport, Chief Ojo Maduekwe, announced after the Federal Executive Council (FEC) meeting in Abuja, yesterday that the incentives included the granting of pioneer status to the company in the area of cement production for seven years. This means that within the period, no new cement plant will be established in the country. Other incentives include the granting of 2.5 per cent duty on all plants, machinery and quarry equipment, exemption from payment of the Value Added Tax (VAT) on all plant, machinery and quarry equipment and the payment of only five per cent duty on construction materials not available within the country.

Culled from The Guardian 4/24/03

## 8.2.4 Maximizing Profits

If you find it counterintuitive that producing where marginal revenue equals marginal cost will maximize profits, working through the numbers will help.

**Step 1.** Remember that marginal cost is defined as the change in total cost from producing a small amount of additional output.

$$MC = change\ in\ total\ cost\ /\ change\ in\ quantity\ produced$$

**Step 2.** Note that in Table 8.3, as output increases from 1 to 2 units, total cost increases from N1500 to N1800. As a result, the marginal cost of the second unit will be:

$$MC = \frac{N1800 - N1500}{1} = N300$$

**Step 3.** Remember that, similarly, marginal revenue is the change in total revenue from selling a small amount of additional output.

$$MR = change\ in\ total\ revenue\ change\ in\ quantity\ sold$$

**Step 4.** Note that in Table 8.3, as output increases from 1 to 2 units, total revenue increases from N1200 to N2200. As a result, the marginal revenue of the second unit will be:

$$MR = \frac{N2200 - N1200}{1} = N1000$$

Table 8.3: Marginal revenue, Marginal cost, Marginal profit and total profit

| QUANTITY | MARGINAL REVENUE | MARGINAL COST | MARGINAL PROFIT | TOTAL PROFIT |
|---|---|---|---|---|
| 1 | 1200 | 1500 | -300 | -300 |
| 2 | 1000 | 300 | 700 | 400 |
| 3 | 800 | 400 | 400 | 800 |
| 4 | 600 | 600 | 0 | 800 |
| 5 | 400 | 700 | -300 | 500 |
| 6 | 200 | 900 | -700 | -200 |
| 7 | 0 | 1200 | -1200 | -1400 |

**Tip**

A monopolist is not a price taker, because when it decides what quantity to produce, it also determines the market price. For a monopolist, total revenue is relatively low at low quantities of output, because not much is being sold.

Total revenue is also relatively low at very high quantities of output, because a very high quantity will sell only at a low price. Thus, total revenue for a monopolist will start low, rise, and then decline. The marginal revenue for a monopolist from selling additional units will decline. Each additional unit sold by a monopolist will push down the overall market price, and as more units are sold, this lower price applies to more and more units.

## 8.2.5 The Inefficiency of Monopoly

Most people criticize monopolies because they charge too high a price, but what economists object to is that monopolies do not supply enough output to be allocatively efficient. To understand why a monopoly is inefficient, it is useful to compare it with the benchmark model of perfect competition.

## 8.2.6 Allocative Efficiency

**Allocative Efficiency**

Considering consumer's preferences, this is an output level where the price equals the Marginal Cost (MC) of production, thereby giving optimal distribution of goods and services.

This is a social concept. It refers to producing the optimal quantity of some output, the quantity where the marginal benefit to society of one more unit just equals the marginal cost. The rule of profit maximization in a world of perfect competition was for each firm to produce the quantity of output where P = MC, where the price (P) is a measure of how much buyers value the good and the marginal cost (MC) is a measure of what marginal units cost society to produce. Following this rule assures allocative efficiency. If P > MC, then the marginal benefit to society (as measured by P) is greater than the marginal cost to society of producing additional units, and a greater quantity should be produced. But in the case of monopoly, price is always greater than marginal cost at the profit-maximizing level of output. Thus, consumers will suffer from a monopoly

because a lower quantity will be sold in the market, at a higher price, than would have been the case in a perfectly competitive market.

The problem of inefficiency for monopolies often runs even deeper than these issues, and also involves incentives for efficiency over longer periods of time. There are counterbalancing incentives here. On one side, firms may strive for new inventions and new intellectual property because they want to become monopolies and earn high profits—at least for a few years until the competition catches up. In this way, monopolies may come to exist because of competitive pressures on firms. However, once a barrier to entry is in place, a monopoly that does not need to fear competition can just produce the same old products in the same old way—while still ringing up a healthy rate of profit. John Hicks, who won the Nobel Prize for economics in 1972, wrote in 1935: "*The best of all monopoly profits is a quiet life."* He did not mean the comment in a complimentary way. He meant that monopolies may bank their profits and slack off on trying to please their customers.

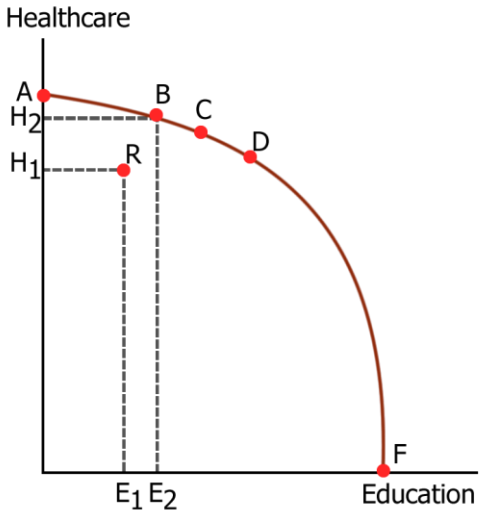
When NITEL provided all of the local and long-distance phone service in the Nigeria, along with manufacturing most of the phone equipment, the payment plans and types of phones did not change much. But around year 2000 when mobile telephone companies found their ways into Nigeria, Nitel lost its monopoly power. Then an explosion of innovation followed. Services like call waiting, caller ID, three-way calling, voice mail through the Phone Company, mobile phones, and wireless connections to the Internet all became available. A wide range of payment plans was offered, as well. The end of the telephone monopoly brought lower prices, a greater quantity of services, and also a wave of innovation aimed at attracting and pleasing customers.

## 8.2.7 Production Possibility Frontier

Figure 8.5 illustrates these ideas using a production possibilities frontier between healthcare and education. A production possibilities curve is a graphical representation of the alternative combinations of goods and services an economy can produce. The production possibilities frontier can illustrate two kinds of efficiency: productive efficiency and allocative efficiency. Productive efficiency means it is impossible to produce more of one good without decreasing the quantity that is produced of another good. Thus, all choices along a given PPF like B, C, and D display productive efficiency, but R does not.

Allocative efficiency means that the particular mix of goods being produced—that is, the specific choice along the production possibilities frontier—represents the allocation that society most desires.

Figure 8.5: Production Possibility Frontier




# Session Review

## 8.1 Explain how monopoly is formed

Barriers to entry prevent or discourage competitors from entering the market. These barriers include: economies of scale that lead to natural monopoly; control of a physical resource; legal restrictions on competition; patent, trademark and copyright protection; and practices to intimidate the competition like predatory pricing.

## 8.2 Discuss how a profit-maximising monopoly choose output and price

The monopolist will select the profit-maximizing level of output where MR = MC, and then charge the price for that quantity of output as determined by the market demand curve. If that price is above average cost, the monopolist earns positive profits.
Monopolists are not productively efficient, because they do not produce at the minimum of the average cost curve. Monopolists are not allocatively efficient, because they do not produce at the quantity where P = MC.

# Assessment

**SAQ 8.1 (tests Learning Outcome 8.1)**

1. If Natural Monopoly often arise in industries where the marginal cost of adding an additional customer is very low once the fixed costs of the overall system are in place, what then is Legal Monopoly.
2. If you have an innovative idea that could change the world, what kind of protective laws can you obtain to keep this idea safe?
3. Mr. Anthony owns a firm that produces Notebooks and sells at ₦50per notebook. After discovering that Mr. Benson is also entering the market to be producing notebook, Mr. Anthony reduces the price to ₦20per notebook. Since Mr. Benson cannot cover his cost of production, he ran into loss and was

frustrated out of the market. What kind of pricing do Economist call the reduction Mr. Anthony carried out? Explain.

**SAQ 8.2 (tests Learning Outcome 8.2)**

What is allocative efficiency?

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 9

# Introduction to Monopolistic Competition


Beveraged drinks but unique brands compete at same market

## INTRODUCTION

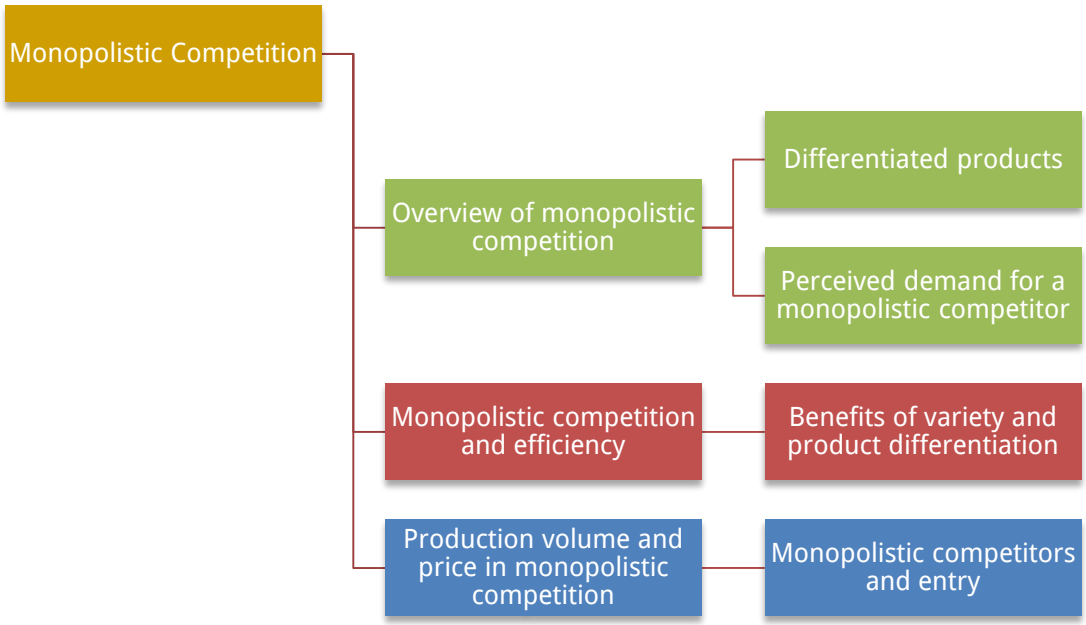
In this study session, we will discuss another variation of imperfect competition: monopolistic competition. We will also examine the benefits of variety and differentiation.

### Learning Outcomes

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

9.1 *explain* monopolistic competition
9.2 *outline* the process of efficiency in monopolistic competition
9.3 *show* how a monopolistic competitor determines how much to produce and at what price

## Study Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| **Monopolistic competition** | A type of imperfect competition such that many producers sell products that are differentiated from one another hence are not perfect substitutes. |

# 9.1 OVERVIEW OF MONOPOLISTIC COMPETITION

**Monopolistic competition** involves many firms competing against each other, but selling products that are distinctive in some way. Examples include stores that sell different styles of clothing; restaurants or grocery stores that sell different kinds of food; and even products like golf balls or beer that may be at least somewhat similar but differ in public perception because of advertising and brand names. When products are distinctive, each firm has a mini-monopoly on its particular style or flavour or brand name.

However, firms producing such products must also compete with other styles, flavour and brand names. The term "monopolistic competition" captures this mixture of mini-monopoly and tough competition.

## 9.1.1 Differentiated Products

A firm can try to make its products different from those of its competitors in several ways: physical aspects of the product, location from which the product is sold, intangible aspects of the product, and perceptions of the product. Products that are distinctive in one of these ways are called differentiated products.

Physical aspects of a product include all the phrases you hear in advertisements: unbreakable bottle, non-stick surface, freezer-to-microwave, non-shrink, extra spicy, newly redesigned for your comfort. The location of a firm can also create a difference between producers. For example, a petrol station located at a heavily travelled intersection can probably sell more petrol, because more cars drive by that corner. A supplier to an automobile manufacturer may find that it is an advantage to locate close to the car factory.

Intangible aspects can differentiate a product, too. Some intangible aspects may be promises like a guarantee of satisfaction or money back, a reputation for high quality, services like free delivery, or offering a loan to purchase the product.

Finally, product differentiation may occur in the minds of buyers. For example, many people could not tell the difference in taste between common varieties of beer or cigarettes if they were blindfolded but, because of past habits and advertising, they have strong preferences for certain brands. Advertising can play a role in shaping these intangible preferences.

## Focus: Coke Vs Pepsi


Figure 9.1: Coca-cola and Pepsi in market contest

The rivalry between Coca-Cola and Pepsi is legendary. Although the feud really heated up with the Pepsi Challenge in 1975 —which prompted Coca-Cola's horrific New Coke debacle — the brands have been fighting each other for more than a century. And not just about product development. Things occasionally get personal, which

sometimes resonates in their marketing. For example, the introduction of the extra 20% by Pepsi also made Coca-Cola introduce its own extra 20% variety.

Adapted from: http://www.businessinsider.com/soda-wars-coca-cola-pepsi-history-infographic-2011-11

**Activity**

Highlight the different brands of both Coca cola and Pepsi. This will help you to understand the type of competition that exist between the two companies.

**Tip**

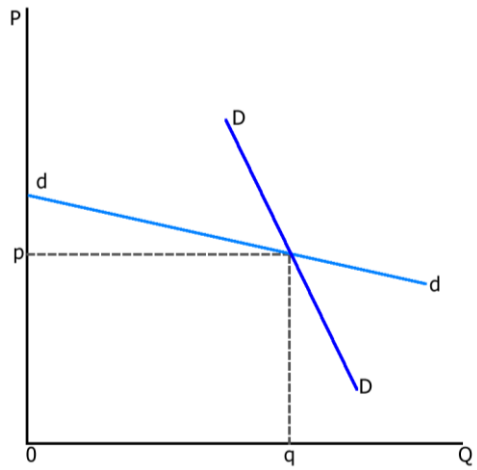
Monopolistically competitive industries do offer benefits to consumers in the form of greater variety and incentives for improved products and services. There is some controversy over whether a market-oriented economy generates too much variety.

The concept of differentiated products is closely related to the degree of variety that is available. If everyone in the economy wore only blue jeans, ate only white bread, and drank only tap water, then the markets for clothing, food, and drink would be much closer to perfectly competitive. The variety of styles, flavours, locations, and characteristics creates product differentiation and monopolistic competition.

## 9.1.2 Perceived Demand for a Monopolistic Competitor

A monopolistically competitive firm perceives a demand for its goods; that is, an intermediate case between monopoly and competition offers a reminder that the demand curve as faced by a perfectly competitive firm is perfectly elastic or flat, because the perfectly competitive firm can sell any quantity it wishes at the prevailing market price. In contrast, the demand curve, as faced by a monopolist, is the market demand curve, since a monopolist is the only firm in the market, and hence is downward sloping.

Figure 9.1 Perceived demand for firms in monopolistic competition



The demand curve faced by a perfectly competitive firm is perfectly elastic, meaning it can sell all the output it wishes at the prevailing market price. The demand curve faced by a monopoly is the market demand. It can sell more output only by decreasing the price it charges. The demand curve faced by a monopolistically competitive firm falls in between.

The demand curve as faced by a monopolistic competitor is not flat, but rather downward-sloping, which means that the monopolistic competitor can raise its price without losing all of its customers or lower the price and gain more customers. Since there are substitutes, the demand curve facing a monopolistically competitive firm is more elastic than that of a monopoly where there are no close substitutes. If a monopolist raises its price, some consumers will choose not to purchase its product—but they will then need to buy a completely different product. However, when a monopolistic competitor raises its price, some consumers will choose not to purchase the product at all, but others will choose to buy a similar product from another firm. If a monopolistic competitor raises its price, it will not lose as many customers as would a perfectly competitive firm, but it will lose more customers than would a monopoly that raised its prices.

## Self-Check

**Question**

- Highlight the key assumptions of monopolistic competition.

**Feedback**

- These are:
  1. Each firm produces one specific variety or brand of the industry's differentiated product.
  2. The industry contains so many firms that each one ignores the possible reactions of its many competitors when it makes its own price and output decisions.
  3. There is freedom of entry and exit in the industry.
  4. There is symmetry. This simply means a new entrant into the market or industry takes sales in equal proportion from all existing firms.

## Tip

The perceived demand curve for monopolistically competitive firm is downward-sloping, which shows that it is a price maker and chooses a combination of price and quantity. However, the perceived demand curve for a monopolistic competitor is more elastic than the perceived demand curve for a monopolist, because the monopolistic competitor has direct competition, unlike the pure monopolist.

# 9.2 MONOPOLISTIC COMPETITION AND EFFICIENCY

The long-term result of entry and exit in a perfectly competitive market is that all firms end up selling at the price level determined by the lowest point on the average cost curve. This outcome is why perfect competition displays productive efficiency: goods are being produced at the lowest possible average cost. However, in monopolistic competition, the end result of entry and exit is that firms end up with a price that lies on the downward-sloping portion of the average cost curve, not at the very bottom of the AC curve. Thus, monopolistic competition will not be productively efficient.

**Note**

If the firms in a monopolistically competitive industry are earning economic profits, the industry will attract entry until profits are driven down to zero in the long run. If the firms in a monopolistically competitive industry are suffering economic losses, then the industry will experience exit of firms until economic profits are driven up to zero in the long run.

## 9.2.1 THE BENEFITS OF VARIETY AND PRODUCT DIFFERENTIATION

Even though monopolistic competition does not provide productive efficiency or allocative efficiency, it does have benefits of its own. Product differentiation is based on variety and innovation. Many people would prefer to live in an economy with many kinds of clothes, foods, and car styles; not in a world of perfect competition where everyone will always wear blue jeans and white shirts, eat only spaghetti with plain red sauce, and drive an identical model of car. Many people would prefer to live in an economy where firms are struggling to figure out ways of attracting customers by methods like friendlier service, free delivery, guarantees of quality, variations on existing products, and a better shopping experience. Economists have struggled, with only partial success, to address the question of whether a market-oriented economy produces the optimal amount of variety. Critics of market-oriented economies argue that society does not really need dozens of different athletic shoes or breakfast cereals or automobiles. They argue that much of the cost of creating such a high degree of product differentiation, and then of advertising and marketing this differentiation, is socially wasteful—that is, most people would be just as happy with a smaller range of differentiated products produced and sold at a lower price. Defenders of a market-oriented economy respond that if people do not want to buy differentiated products or highly advertised brand names, no one is forcing them to do so. Moreover, they argue that consumers benefit substantially when firms seek short-term profits by providing differentiated products. This controversy may never be fully resolved, in part because deciding on the optimal amount of variety is very difficult, and in part because the two sides often place different values on what variety means for consumers.

**Tip**

If an existing firm is making profit, it will entice other firms from entering the market. The firms in a Monopolistic competition are always making moves to maximize their profit by determining the level of output that will be most profitable.

**SELF-CHECK**

**Question**

- _____ involves many firms competing against each other, but selling products that are distinctive in some way.
  A. Perfect competition
  B. Monopolistic competition
  C. Monopoly

**Feedback**

- B - Monopolistic competition involves many firms selling products that are similar but not identical. An example of monopolistic competition market is the soft drink industry.

# 9.3 HOW A MONOPOLISTIC COMPETITOR DETERMINES HOW MUCH TO PRODUCE AND AT WHAT PRICE

The process by which a monopolistic competitor chooses its profit-maximizing quantity and price resembles closely how a monopoly makes these decisions process:

First, the firm selects the profit-maximizing quantity to produce. Then the firm decides what price to charge for that quantity.

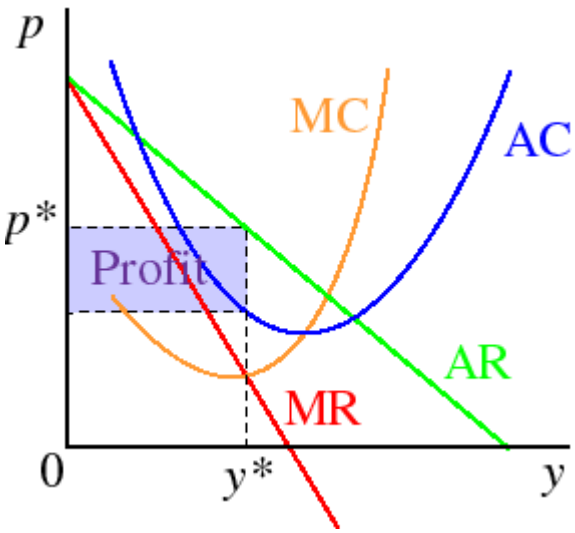
**Step 1**. The monopolistic competitor determines its profit-maximizing level of output. In this case, the Plastic Company will determine the profit-maximizing quantity to produce by considering its marginal revenues and marginal costs. Two scenarios are possible:

- If the firm is producing at a quantity of output where marginal revenue exceeds marginal cost, then the firm should keep expanding production, because each marginal unit is adding to profit by bringing in more revenue than its cost. In this way, the firm will produce up to the quantity where MR = MC.
- If the firm is producing at a quantity where marginal costs exceed marginal revenue, then each marginal unit is costing more than the revenue it brings in, and the firm will increase its profits by reducing the quantity of output until MR = MC.

In this example, MR and MC intersect at a quantity of 40, which is the profit-maximizing level of output for the firm.

**Step 2**. The monopolistic competitor decides what price to charge. When the firm has determined its profit- maximizing quantity of output, it can then look to its perceived demand curve to find out what it can charge for that quantity of output. On the graph, this process can be shown as a vertical line reaching up through the profit-maximizing quantity until it hits the firm's perceived demand curve. See figure figure 9.3

Figure 9.3 Profit Maximising Graph of a Monopoly




## Self-Check

**Question**

- Highlight two characteristics of monopolistic competition.

**Feedback**

- The characteristics of monopolistic competition includes:
  i - Product differentiation
  ii - Active involvement in price setting

Although the process by which a monopolistic competitor makes decisions about quantity and price is similar to the way in which a monopolist makes such decisions, two differences are worth remembering. First, although both a monopolist and a monopolistic competitor face downward-sloping demand curves, the monopolist's perceived demand curve is the market demand curve, while the perceived demand curve for a monopolistic competitor is based on the extent of its product differentiation and how many competitors it faces. Second, a monopolist is surrounded by barriers to entry and need not fear entry, but a monopolistic competitor who earns profits must expect the entry of firms with similar, but differentiated, products.

# 9.3.1 Monopolistic Competitors and Entry

If one monopolistic competitor earns positive economic profits, other firms will be tempted to enter the market. A petrol station with a great location must worry that other petrol stations might open across the street or down the road—and perhaps the new petrol stations will sell coffee or have a carwash or some other attraction to lure customers. A successful restaurant with a unique barbecue sauce must be concerned that other restaurants will try to copy the sauce or offer their own unique recipes. A laundry detergent with a great reputation for quality must be concerned that other competitors may seek to build their own reputations.

The entry of other firms into the same general market (like petrol, restaurants, or detergent) shifts the demand curve faced by a monopolistically competitive firm. As more firms enter the market, the quantity demanded at a given price for any particular firm will decline, and the firm's perceived demand curve will shift to the left. As a firm's perceived demand curve shifts to the left, its marginal revenue curve will shift to the left, too. The shift in marginal revenue will change the profit-maximizing quantity that the firm chooses to produce, since marginal revenue will then equal marginal cost at a lower quantity.

Unlike a monopoly, with its high barriers to entry, a monopolistically competitive firm with positive economic profits will attract competition.

As long as the firm is earning positive economic profits, new competitors will continue to enter the market, reducing the original firm's demand and marginal revenue curves. When price is equal to average cost, economic profits are zero. Thus, although a monopolistically competitive firm may earn positive economic profits in the short term, the process of new entry will drive down economic profits to zero in the long run. Remember that zero economic profit is not equivalent to zero accounting profit. A zero economic profit means the firm's accounting profit is equal to what its resources could earn in their next best use.

**Note**

Monopolistic competitors can make an economic profit or loss in the short run, but in the long run, entry and exit will drive these firms toward a zero economic profit outcome. However, the zero economic profit outcome in monopolistic competition looks different from the zero economic profit outcome in perfect competition in several ways relating both to efficiency and to variety in the market.

# Session Review

## 9.1 Explain monopolistic competition

Monopolistic competition refers to a market where many firms sell differentiated products. Differentiated products can arise from characteristics of the good or service, location from which the product is sold, intangible aspects of the product, and perceptions of the product.

## 9.2 Outline the process of efficiency in monopolistic competition

A monopolistically competitive firm is not productively efficient because it does not produce at the minimum of its average cost curve. A monopolistically competitive firm is not allocatively efficient because it does not produce where P = MC, but instead produces where P > MC. Thus, a monopolistically competitive firm will tend to produce a lower quantity at a higher cost and to charge a higher price than a perfectly competitive firm.

## 9.3 Discuss how a monopolistic competitor determines how much to produce and at what price

A profit-maximizing monopolistic competitor will seek out the quantity where marginal revenue is equal to marginal cost. The monopolistic competitor will produce that level of output and charge the price that is indicated by the firm's demand curve.

## Key terms that I've discovered

. . .

# Assessment

**SAQ 9.1 (tests Learning Outcome 9.1)**

When firms are competing against each other, but selling products that are distinctive in same way is called Monopolistic Competition. Yes or No? Give reasons for you answer.

**SAQ 9.2 (tests Learning Outcome 9.2)**

After a monopolistic firm chooses its profit maximising output, what is the next step it takes to maximise profit?

**SAQ 9.3 (Test Learning Outcome 9.3)**

Some critics of market oriented economy argued that much of the cost of creating a high degree of product differentiation, and then of advertising and marketing this differentiation, is socially wasteful—that is, most people would be just as happy with a smaller range of differentiated products produced and sold at a lower price. Do you agree with them? Give your reasons.

# Resources

### Articulate Presentation

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

### Schoolboard

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Study Session 10

# Introduction to Oligopoly


OPEC Headquaters, Vienna (www.foreignaffairs.com)

## INTRODUCTION

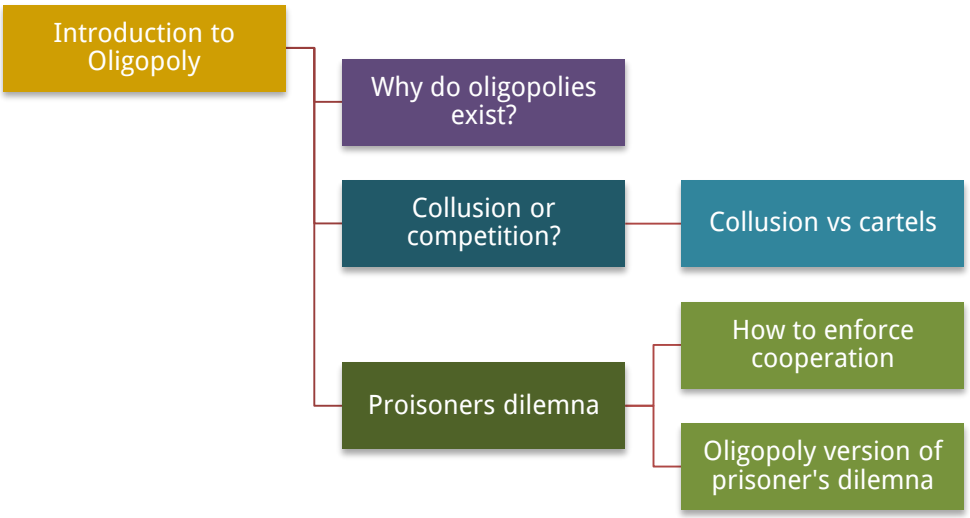
In this study session, we will discuss another variation of imperfect competition: oligopoly. This is a type of market structure in which there are only a few rival firms whose economic well-being and behaviour is mutually interdependent. One firm's actions influence the actions of other firms. You are likely familiar with OPEC, it's a cartel of oil producing countries. OPEC is an example of oligopoly. Nigeria is a member nation.

### Learning Outcomes

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

10.1 *give* reasons why oligopoly exists
10.2 *discuss* between collusion and competition
10.3 *explain* what Prisoner's Dilemma is.

## Study Session Preview




## Study Session Duration

This Study Session requires a one hour of formal study time. You may spend an additional two hours for revision.

## Terminologies

| | |
|---|---|
| Oligopoly | A state of limited competition, in which a market is shared by a small number of producers or sellers. |

# 10.1 WHY DO OLIGOPOLIES EXIST

Many purchases that individuals make at the retail level are produced in markets that are neither perfectly competitive, monopolies, nor monopolistically competitive. Rather, they are oligopolies. **Oligopoly** arises when a small number of large firms have all or most of the sales in an industry. Examples of oligopoly abound and include the auto industry, cable television, and commercial air travel. Oligopolistic firms are like cats in a bag. They can either scratch each other to pieces or cuddle up and get comfortable with one another. If oligopolists compete hard, they may end up acting very much like perfect competitors, driving down costs and leading to zero profits for all. If oligopolists collude with each other, they may effectively act like a monopoly and succeed in pushing up prices and earning consistently high levels of profit. Oligopolies are typically characterized by mutual interdependence where various decisions such as output, price, advertising, and so on, depend on the decisions of the other firm(s). Analysing the choices of oligopolistic firms about pricing and quantity produced involves considering the pros and cons of competition versus collusion at a given point in time.

A combination of the barriers to entry that create monopolies and the product differentiation that characterizes monopolistic competition can create the setting for an oligopoly.

For example, when a government grants a patent for an invention to one firm, it may create a monopoly. When the government grants patents to, for example, three different pharmaceutical companies that each has its own drug for reducing high blood pressure, those three firms may become an oligopoly.

Similarly, a natural monopoly will arise when the quantity demanded in a market is only large enough for a single firm to operate at the minimum of the long-run average cost curve. In such a setting, the market has room for only one firm, because no smaller firm can operate at a low enough average cost to compete, and no larger firm could sell what it produced given the quantity demanded in the market.

Quantity demanded in the market may also be two or three times the quantity needed to produce at the minimum of the average cost curve—which means that the market would have room for only two or three oligopoly firms (and they need not produce differentiated products). Again, smaller firms would have higher average costs and be unable to compete, while additional large firms would produce such a high quantity that they would not be able to sell it at a profitable price. This combination of economies of scale and market demand creates the barrier to entry, which led to the Boeing-Airbus oligopoly for large passenger aircraft.

The product differentiation at the heart of monopolistic competition can also play a role in creating oligopoly. For example, firms may need to reach a certain minimum size before they are able to spend enough on advertising and marketing to create a recognizable brand name. The problem in competing with, say, Coca-Cola or Pepsi is not that producing fizzy drinks is technologically difficult, but rather that creating a brand name and marketing effort to equal Coke or Pepsi is an enormous task.

### SELF-CHECK

**Question**

- Which assumption of oligopolistic firms is its most distinguish feature?

**Feedback**

- The most distinguish feature of oligopolistic firms is its mutual interdependence among its members firms that made up the firms.

# 10.2 COLLUSION OR COMPETITION?

When oligopoly firms in a certain market decide what quantity to produce and what price to charge, they face a temptation to act as if they were a monopoly. By acting together, oligopolistic firms can hold down industry output, charge a higher price, and divide up the profit among themselves. When firms act together in this way to reduce

output and keep prices high, it is called **collusion**. A group of firms that have a formal agreement to collude to produce the monopoly output and sell at the monopoly price is called a **cartel**.

## 10.2.1 Collusion versus Cartels

How can I tell which is which?

In the United States, unlike Nigeria, it is illegal for firms to collude since collusion is anti-competitive behaviour, which is a violation of antitrust law. Both the Antitrust Division of the Justice Department and the Federal Trade Commission have responsibilities for preventing collusion in the United States.

The problem of enforcement is finding hard evidence of collusion. Cartels are formal agreements to collude. Because cartel agreements provide evidence of collusion, they are rare in the United States. Instead, most collusion is tacit, where firms implicitly reach an understanding that competition is bad for profits.

**Collision**

A situation in which firms act together to hold down industry output, charge a higher price, and divide up the profit among themselves.

**Cartel**

An association of manufacturers or suppliers formed especially to regulate prices and output in some field of business.

The desire of businesses to avoid competing so that they can instead raise the prices that they charge and earn higher profits has been well understood by economists. Adam Smith wrote in Wealth of Nations in 1776: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices."

Even when oligopolists recognize that they would benefit as a group by acting like a monopoly, each individual oligopoly faces a private temptation to produce just a slightly higher quantity and earn slightly higher profit—while still counting on the other oligopolists to hold down their production and keep prices high. If at least some oligopolists give in to this temptation and start producing more, then the market price will fall. Indeed, a small handful of oligopoly firms may end up competing so fiercely that they all end up earning zero economic profits—as if they were perfect competitors.

### SELF-CHECK

**Question**

- Fill the following blank spaces from the following options:
  Oligopoly, Natural Monopoly, Collusion, Competition
  1. _____ will arise when the quantity demanded in a market is only large enough for a single firm to operate at the minimum of the long-run average cost curve.
  2. When firms act together in a way to reduce output and keep prices high, it is called _____

**Feedback**

1. The situation that will arise when the quantity demanded in a market is only large enough for a single firm to operate at the minimum of the long-run average cost curve is called Natural monopoly.

2. Collusion arises when firms act together in a way to reduce output and keep prices high.

## Focus: Oligopoly in Nigerian Banking Sector

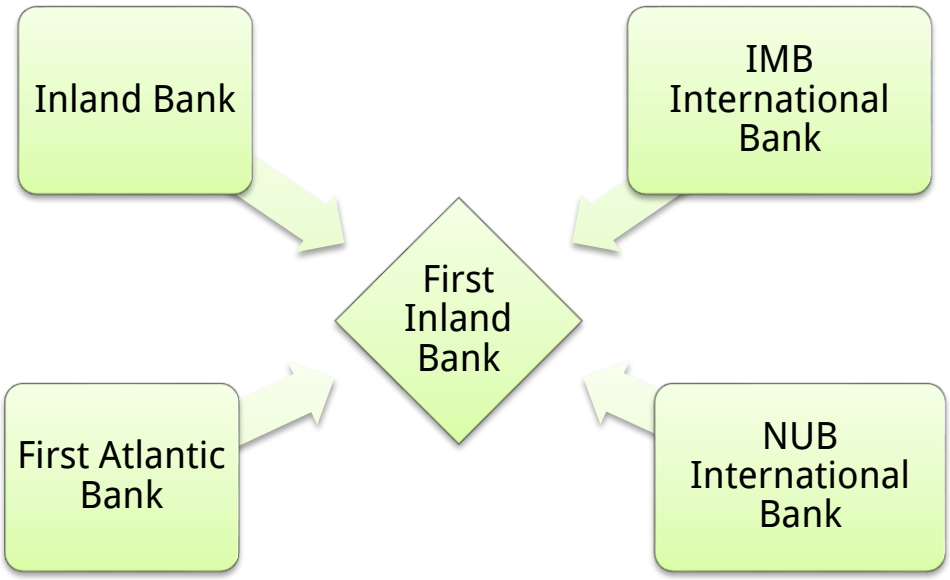



Figure 10.1: 2004/05 Bank merger in Nigeria

If the various round of reforms in the banking industry leading to one consolidation after another in the past was to ensure stronger players in Nigeria and reduce the number of fringe players, a new report indicates that oligopoly in the industry would not go away in a hurry, or anytime soon. According to a report on the Nigerian banking industry by the research arm of Citi Bank, authored by Kato Mukuru, there is need for Tier 2 banks to consolidate to survive on the long-run, in a clime where competition for size, space and profit have become fiercer. The report dated May 31, 2013, noted that the industry has become increasingly concentrated and the oligopolistic tendency more intense, judging by parameters such as the top 13 banks accounting for 90 per cent of industry assets at the end of 2012, up from 81 per cent in 2001. To put the situation in proper perspective, the Citi report noted that in 2001, there were 90 licensed banks, meaning that 77 were outside the club, and seven by 2012 (including the three banks owned by the Asset Management Corporation of Nigeria). "The number of banks is important because it shows how much pressure has built up within the universe of Tier 2 banks, especially when one considers that the asset share of Tier 3 banks has fallen to 10 per cent of total in 2012 (from 19 per cent in 2001). With an ever-reducing pool of Tier 3 assets, the Tier 2 banks will increasingly have to compete directly against each other and the Tier 1 banks for incremental share. In our opinion, this is what is creating the intense competitive pressures in the system," the report added. The Tier banks are mid-players include: Diamond, Skye, Fidelity, First City Monument Bank, Stanbic IBTC Bank, and Sterling; while others like Mainstreet, Keystone and Enterprise banks (three of which were nationalized and subsequently acquired by the Asset Management Corporation of Nigeria), Wema Bank and Unity Bank. This, the report continued, was also true of profit, as the share of Tier 2 players has fallen more than half from 46 per cent in 2001 to 21 per cent by 2012, while that of the Tier 1 banks rose from 35 per cent in 2001 to 74 per cent. Over the years, the report shows, the gaps across basic parameters have continued to widen, with total assets of the Tier 3 banks at N2 trillion, which is almost N1 trillion less than that of First Bank's N3 trillion. In 2012 also, the collective assets of the top

3 tier 1 banks, was more than the N7.7 trillion cumulative assets of the Tier 2 banks. This is just as the combined profit of the tier 2 banks in 2012 was almost half that of Guaranty Trust and Zenith banks combined.

Source: http://www.nigerianbestforum.com/blog/oligopoly-in-nigerias-banking-industry-intensifying-report/

# 10.3 THE PRISONER'S DILEMMA

Because of the complexity of oligopoly, which is the result of mutual interdependence among firms, there is no single, generally-accepted theory of how oligopolies behave, in the same way that we have theories for all the other market structures. Instead, economists use game theory, a branch of mathematics that analyses situations in which players must make decisions and then receive payoffs based on what other players decide to do. Game theory has found widespread applications in the social sciences, as well as in business, law, and military strategy.

The **prisoner's dilemma** is a scenario in which the gains from cooperation are larger than the rewards from pursuing self-interest. It applies well to oligopoly. The story behind the prisoner's dilemma goes like this:

> Two co-conspiratorial criminals are arrested. When they are taken to the police station, they refuse to say anything and are put in separate interrogation rooms. Eventually, a police officer enters the room where Prisoner A is being held and says: "You know what? Your partner in the other room is confessing. So your partner is going to get a light prison sentence of just one year, and because you're remaining silent, the judge is going to stick you with eight years in prison. Why don't you get smart? If you confess, too, we'll cut your jail time down to five years, and your partner will get five years, also." Over in the next room, another police officer is giving exactly the same speech to Prisoner B. What the police officers do not say is that if both prisoners remain silent, the evidence against them is not especially strong, and the prisoners will end up with only two years in jail each.

The game theory situation facing the two prisoners is shown in Table 10.1. To understand the dilemma, first consider the choices from Prisoner A's point of view. If A believes that B will confess, then A ought to confess, too, so as to not get stuck with the eight years in prison. But if A believes that B will not confess, then A will be tempted to act selfishly and confess, so as to serve only one year. The key point is that A has an incentive to confess regardless of what choice B makes! B faces the same set of choices, and thus will have an incentive to confess regardless of what choice A makes. Confess is considered the dominant strategy or the strategy an individual (or firm) will pursue regardless of the other individual's (or firm's) decision. The result is that if prisoners pursue their own self-interest, both are likely to confess, and end up doing a total of 10 years of jail time between them.

**Prisoner's dilemma**

A situation in which two players have two options each, whose outcome depends crucially on the simultaneous choice made by the other.

Table 10.1 The Prisoner's Dilemma Problem

| | | Prisoner B | |
|---|---|---|---|
| | | Remain Silent (cooperate with other | Confess (do not cooperate with other |
| **Prisoner A** | Remain Silent (cooperate with other) | A gets 2 years, B gets 2 years | A gets 8 years, B gets 1 year |
| | Confess (do not cooperate with other) | A gets 1 year, B gets 8 years | A gets 5 years B gets 5 years |

The game is called a dilemma because if the two prisoners had cooperated by both remaining silent, they would only have had to serve a total of four years of jail time between them. If the two prisoners can work out some way of cooperating so that neither one will confess, they will both be better off than if they each follow their own individual self-interest, which in this case leads straight into longer jail terms.

**Self-Check**

**Question**

- Non-price competition strategy oligopolistic firm usually adopt to gain the market is _____ and _____.

**Feedback**

- Advertising and Variation in design are two of the non-price competition strategies an oligopolistic firm usually adopts to gain the market.

## 10.3.1 How to Enforce Cooperation

How can parties who find themselves in a prisoner's dilemma situation avoid the undesired outcome and cooperate with each other? The way out of a prisoner's dilemma is to find a way to penalize those who do not cooperate. Perhaps the easiest approach for colluding oligopolists, as you might imagine, would be to sign a contract with each other that they will hold output low and keep prices high. Certain international organizations, like the nations that are members of the Organization of Petroleum Exporting Countries (OPEC), have signed international agreements to act like a monopoly, hold down output, and keep prices high so that all of the countries can make high profits from oil exports. Such agreements, however, because they fall in a gray area of international law, are not legally enforceable. If Nigeria, for example, decides to start cutting prices and selling more oil, Saudi Arabia cannot sue Nigeria in court and force it to stop.

**Tip**

In order to enforce cooperation among parties in an oligopolistic condition, parties must sign undertaken to abide by the agreement reached by members.

## 10.3.2 Oligopoly Version of the Prisoner's Dilemma

The members of an oligopoly can face a prisoner's dilemma, also. If each of the oligopolists cooperates in holding down output, then high monopoly profits are possible. Each oligopolist, however, must worry that while it is holding down output, other firms are taking advantage of the high price by raising output and earning higher profits.

Table10.2. shows the prisoner's dilemma for a two-firm oligopoly—known as a duopoly. If Firms A and B both agree to hold down output, they are acting together as a monopoly and will each earn ₦1,000 in profits. However, both firms' dominant strategy is to increase output, in which case each will earn ₦400 in profits.

Table 10.2 A Prisoner's Dilemma for Oligopolists

| | | **Firm B** | |
|---|---|---|---|
| | | Hold Down Output (cooperate with other firm) | Increase Output (do not cooperate |
| **Firm A** | Hold Down Output (cooperate with other firm) | A gets ₦1,000, B gets ₦1,000 | A gets ₦200, B gets ₦1,500 |
| | Increase Output (do not cooperate with | A gets ₦1,500, B gets ₦200 | A gets ₦400, B gets ₦400 |

Can the two firms trust each other?

Consider the situation of Firm A:

- If A thinks that B will cheat on their agreement and increase output, then A will increase output, too, because for A the profit of ₦400 when both firms increase output (the bottom right-hand choice in Table 10.3) is better than a profit of only ₦200 if A keeps output low and B raises output (the upper right-hand choice in the table).
- If A thinks that B will cooperate by holding down output, then A may seize the opportunity to earn higher profits by raising output. After all, if B is going to hold down output, then A can earn ₦1,500 in profits by expanding output (the bottom left-hand choice in the table) compared with only ₦1,000 by holding down output as well (the upper left-hand choice in the table).

Thus, firm A will reason that it makes sense to expand output if B holds down output and that it also makes sense to expand output if B raises output. Again, B faces a parallel set of decisions.

The result of this prisoner's dilemma is often that even though A and B could make the highest combined profits by cooperating in producing a lower level of output and acting like a monopolist, the two firms may well end up in a situation where they each increase output and earn only ₦400 each in profits.

## SELF-CHECK

**Question**

- _____ is a scenario in which the gains from cooperation are larger than the rewards from pursuing self-interest.
  A. the prisoner
  B. the dilemma
  C. the prisoner's dilemma

**Feedback**

- The correct option is (C). A scenario in which the gains from cooperation are larger than the rewards from pursuing self-interest is referred to as the Prisoner's dilemma.

# Session Review

### 10.1 give reasons why Oligopoly exists

An oligopoly arises when a few firms sell most or all of the goods in a market. Oligopolists earn their highest profits if they can band together as a cartel and act like a monopolist by reducing output and raising price.

### 10.2 differentiate between Collusion and Competition

Collusion offers alternatives to engage in competition among firms in an oligopolistic market structure. Collusion is the act of firms working together (cooperating) to establish the price and level of output in a particular market.

### 10.3 explain what Prisoner's Dilemma is

The prisoner's dilemma is an example of game theory. It shows how, in certain situations, all sides can benefit from cooperative behavior rather than self-interested behavior. However, the challenge for the parties is to find ways to encourage cooperative behavior.

# Assessment

**SAQ 10.1 (tests Learning Outcome 10.1)**

"*When the government grants patents to, for example, three different pharmaceutical companies that each has its own drug for reducing high blood pressure, those three firms may become an oligopoly"*

The above statement is one of the reasons for the existence of Oligopoly, list other reasons.

**SAQ 10.2 (tests Learning Outcome 10.2)**

When firms struggle to outsmart one another in other to make maximum profit, we call it Competition. In your own words, explain what you understand by Collusion.

**SAQ 10.3 (tests Learning Outcome 10.3)**

The prisoner's dilemma is a scenario in which the gains from cooperation are larger than the rewards from pursuing self-interest. Try create your own Prisoner's Dilemma situation.

# Resources

**Articulate Presentation**

This is a complimentary resource to facilitate the quick delivery of this session. It is available in your course pack (Schoolboard disc / online page), and also linked here.

**Schoolboard**

Access your schoolboard app, or visit www.schoolboard.edutechportal.org/introductiontomicroeconomics to access updated online activities and resources related to the units of this Study Session.

# Feedback to SAQs

**SAQ 1.1**

The fact that all you listed was not provided for you buttresses the issue of scarcity. Which shows that our wants as human are infinite and the resources available to meet those wants are not sufficient.

**SAQ 1.2**

The old man's method can be called Division of labour. Since Useni digs ground every day, he became a master in it, on the other hand, Okon also became a professional in pulling out yams. Both of them became specialized in their field which increased their productivity from 50 tubers to 200 tubers of yam.

**SAQ 1.3**

The third way of organizing the economy is called Market economy, which is a situation the forces of demand and supply dictates what happens in the market.

**SAQ 2.1**

Since Chidi is the one requesting to buy things from Odafe, he is the one making the demand. (b)The demand curve is a graphical representation of Chidi's demand. (c) If Chidi's customers' income increases that they now bring bigger car for Chidi to repair, his demand curve will shift because of this.

**SAQ 2.2**

All these assumption can be referred to as Ceteris paribus, which means all things being equal.

**SAQ 2.3**

Everybody will besiege the fuel station in order to stock fuel at home. Thereby shifting the demand curve for fuel.

**SAQ 2.4**

Nnamdi who is the car dealer will be the one to make supply.

**SAQ 3.1**

The economic term that describes what happened is referred to as elasticity, and it studies the rate of responsiveness of demand to changes in price.

**SAQ 3.2**

The situation whereby an increase in price of a commodity does not affect the demand for such commodity is referred to as zero elasticity.

**SAQ 3.3**

True. Price is the yardstick that is used to measure the rate of responsiveness of a commodity.

**SAQ 4.1**

The satisfaction you derived from eating a bowl of Apu and Egusi is what economist refers to as Utility.

**SAQ 4.2**

Your ability to measure the utility you derived from eating the Apu and Egusi in utils is called Cardinal approach.

**SAQ 4.3**

What will set in as you continue to consume an additional plate of Apu and Egusi is what Economists refer to as Diminishing marginal utility.

**SAQ 5.1**

Production is the process of transforming raw materials to finished product and it is very important because there is nothing we use that is not produced.

**SAQ 5.2**

The other type of good is referred to as capital goods and it is used to produce other goods.

**SAQ 5.3**

Those factors are what Economists referred to as Factors of production.

**SAQ 5.4**

After acquiring factors of production, you will still need inputs (raw materials) to carry out production processes. These other inputs are referred to as variable inputs.

## SAQ 5.5

Return to scale describes the response of output to a change in the level of all inputs employed.

**SAQ 6.1**

These cost of production is what we refer to as factors of production.

**SAQ 6.2**

Short-run period is a production period which is short enough for firms not to vary all its factors of production during production process.

**SAQ 6.3**

All factors of production will be considered as fixed cost while the inputs will be considered variable cost. The combination of all costs is regarded as Total cost

**SAQ 7.1**

The situation at Uromi market is referred to as perfect competition where there are many buyers and many independent sellers.

**SAQ 7.2**

1. As a competitive market, the firm can only determine the quantity that will give him maximum profit.
2. Marginal revenue is the additional revenue that will be generated by increasing product sales by one unit.
3. When the price is higher than average cost, the firm will definitely earn profit.
4. The gym centre should shut down when the price is less than minimum average variable cost.

**SAQ 8.1**

1. Legal monopoly offers a specific product or service at a regulated price and can either be independently run and government regulated, or government run and regulated.
2. Copyright can be used to protect an innovative idea.
3. What Mr. Anthony did is call predatory pricing, which is the method firms use to discourage firms from entering the market.

**SAQ 8.2**

Allocative efficiency refers to producing the optimal quantity of some output, the quantity where the marginal benefit to society of one more unit just equals the marginal cost.

**SAQ 9.1**

Monopolistic competition is a type of imperfect competition such that many producers sell products that are differentiated from one another (e.g. by branding or quality) and hence are not perfect substitutes. So the answer is yes.

Monopolistic first choose the profit maximizing output and then decide what price to charge.

I will not agree with the critics because a free market allows both the buyer and the sellers to make maximum use of the opportunity that exists in the market.

**SAQ 10.1**

A. A natural monopoly will arise when the quantity demanded in a market is only large enough for a single firm to operate at the minimum of the long-run average cost curve.

B. Quantity demanded in the market may also be two or three times the quantity needed to produce at the minimum of the average cost curve—which means that the market would have room for only two or three oligopoly firms (and they need not produce differentiated products).

C. The product differentiation at the heart of monopolistic competition can also play a role in creating oligopoly.

**SAQ 10.2**

Collusion is when firms act together to hold down industry output, charge a higher price, and divide up the profit among themselves.

**SAQ 10.3**

Imagine a situation where your lecturer caught you and your friend cheating but there no evidence to nail the two of you. However, he has an evidence to nail the two of you for damaging a school property. Create a prisoners' dilemma with this information.

# Glossary of Terms

| | |
|---|---|
| **Allocative Efficiency** | When the point that is chosen, among the points on the production possibility frontier, is socially preferred in a particular and specific sense. |
| **Arc Elasticity method** | An estimate of elasticity. |
| **Budget Constrain** | It shows the various combinations of two goods that are affordable given consumer income. |
| **Cartel** | A group of firms that have a formal agreement to collude to produce the monopoly output and sell at the monopoly price. |
| **Collusion** | When firms act together in a way to reduce output and keep prices high. |
| **Constant Unitary Elasticity** | In either a supply or demand curve, it occurs when a price change of one percent results in a quantity change of one percent. |
| **Copyright** | A form of protection provided by the laws to protect 'original works of authorship' including literary, dramatic, musical, architectural, cartographic, choreographic, pantomimic, pictorial, graphic, sculptural, and audiovisual creations." |
| **Cost of Production** | The monetary value of the inputs used in production process. |
| **Cross Price Elasticity** | The idea that the price of one good is affecting the quantity demanded of a different good. |
| **Demand** | The quantity of a commodity that a consumer is willing to buy at a given price and at a particular period of time |
| **Demand curve** | The graphical representation of the relationship between the quantity demanded of a commodity and its prices. |
| **Demand schedule** | A table which shows the different magnitudes of a commodity being demanded for at various levels of prices. |
| **Diminishing marginal rate of substitution** | It is the rate at which a commodity is substituted for another one by a consumer and yet be of the same level of overall satisfaction. |
| **Direct Production** | This is the type of production in which an individual produces goods and services only for family use or consumption. |
| **Equilibrium** | The point on where quantity demanded equals quantity supplied |
| **Explicit Cost** | The money outlays made by the producer to meet the direct cost of production, that is, the actual expenditures on the factors of production used in the process of production |

| | |
|---|---|
| **Firm** | This is a technical unit engaged in the production of goods and services. |
| **Globalization** | The process of expanding cultural, political, and economic connections between people around the world. |
| **Implicit Cost** | The cost of self-owned assets or self-provided labour which are often overlooked when computing the production expenses of the firm. |
| **Indirect Production** | It is the type of production in which goods and services are produced in large scale mainly for sales or in exchange for other goods. |
| **Input** | This is a factor or resource which when combined with other factors of production helps to produce a given level of output. Examples are labour, land, raw materials etc. |
| **Long Run** | A period in production is a planning period that is long enough for the firm to be able to vary the amount of all factors of production used in production process. |
| **Marginal cost** | The cost per additional unit sold |
| **Marginal Revenue curve** | The curve which shows the additional revenue gained from selling one more unit. |
| **Model** | A simplified framework designed to illustrate complex processes |
| **Monopolistic competition** | Firms competing against each other, but selling products that are distinctive in some way. |
| **Monopoly** | A firm that sells all or nearly all of the goods and services in a given market. |
| **Natural monopolies** | Arise in industries where the marginal cost of adding an additional customer is very low, once the fixed costs of the overall system are in place. |
| **Natural Monopoly** | Arises when the quantity demanded in a market is only large enough for a single firm to operate at the minimum of the long-run average cost curve |
| **Oligopolistic market** | A kind of market dominated by a small number of firms. |
| **Output** | The product of combination of various resources which is usually referred to as goods |
| **Patent** | Gives the inventor the exclusive legal right to make, use, or sell the invention for a limited time |
| **Perfect competition** | Market structure which exists where there are many buyers and many independent sellers in the market for the product. |
| **Price Elasticity** | The ratio between the percentage change in the quantity demanded (Qd) or supplied (Qs) and the corresponding percent change in price. |

| | |
|---|---|
| **Price Elasticity of Demand** | The percentage change in the quantity demanded of a good or service divided by the percentage change in the price. |
| **Price Elasticity Supply** | The percentage change in quantity supplied divided by the percentage change in price. |
| **Primary Production** | This is the production that involves the extraction of raw materials provided by nature. |
| **Prisoner's Dilemma** | A scenario in which the gains from cooperation are larger than the rewards from pursuing self-interest. It applies well to oligopoly |
| **Production** | It is the creation of wealth in the form of goods and provision of services which are capable of satisfying human wants |
| **Productive Efficiency** | Means producing without waste, so that the choice is on the production possibility frontier. |
| **Scarcity** | The condition of having to choose among alternatives. |
| **Secondary Production** | This type of production involves the transformation of basic raw materials or semi – finished goods into final forms that are acceptable to the consumers. |
| **Short Run** | The production period which is so short for the firm to vary the amount of its fixed factors such as land, building, machinery |
| **Supply** | The quantity of goods and services that the producer is willing to sell at a market price. |
| **Supply curve** | The graphical representation of the relationship between the quantity supplied and its prices |
| **Supply schedule** | The table that shows the different magnitude of commodity that the producer is willing to sell at various prices |
| **Tertiary production** | This is concerned with the provision of commercial and professional services to ensure that the goods so produced at the primary and secondary production levels are distributed to the final consumers. |
| **Theory** | A set of assumptions, propositions, or accepted facts that attempts to provide a plausible or rational explanation of cause-and-effect (causal) relationships among a group of observed phenomenon. |
| **Trademark** | An identifying symbol or name for a particular good |
| **Unitary Elasticity** | Proportional responsiveness of either demand or supply |
| **Util** | Unit of utility |
| **Utility** | This is a measure of satisfaction derived from application of resources. It is a measure of preferences over some sets of a goods and services, |

and it represents satisfaction experienced by consumer of goods and services.

**Zero Elasticity**

The extreme case in which a percentage change in price, no matter how large, results in zero change in quantity.