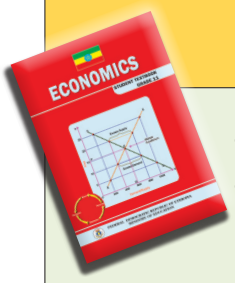
Take Good Care of This Textbook



This textbook is the property of your school.

Take good care not to damage or lose it.

Here are 10 ideas to help take care of the book:

1. Cover the book with protective material, such as plastic, old newspapers or magazines.
2. Always keep the book in a clean dry place.
3. Be sure your hands are clean when you use the book.
4. Do not write on the cover or inside pages.
5. Use a piece of paper or cardboard as a bookmark.
6. Never tear or cut out any pictures or pages.
7. Repair any torn pages with paste or tape.
8. Pack the book carefully when you place it in your school bag.
9. Handle the book with care when passing it to another person.
10. When using a new book for the first time, lay it on its back. Open only a few pages at a time. Press lightly along the bound edge as you turn the pages. This will keep the cover in good condition.

© MoE Ethiopia Not to be published

ECONOMICS

STUDENT TEXTBOOK

GRADE 11

Author, Editor and Reviewer:

C. K Bansal (M.A.)
Atnafu Gebremeskel (M.Sc.)
Eshete Damete (B.A.)

Evaluators:

Abraham Workie
Helen Alemayehu
Fikadu Girma

© MoE-FDR Ethiopia Not to be republished

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
MINISTRY OF EDUCATION

Published E.C. 2003 by the Federal Democratic Republic of Ethiopia, Ministry of Education, under the General Education Quality Improvement Project (GEQIP) supported by IDA Credit No. 4535-ET, the Fast Track Initiative Catalytic Fund and the Governments of Finland, Italy, Netherlands and the United Kingdom.

© 2011 by the Federal Democratic Republic of Ethiopia, Ministry of Education. All rights reserved. No part of this book may be reproduced, stored in a retrieval system or transmitted in any form or by any means including electronic, mechanical, magnetic or other, without prior written permission of the Ministry of Education or licensing in accordance with the Federal Democratic Republic of Ethiopia, Federal Negarit Gazeta, Proclamation No. 410/2004 – Copyright and Neighbouring Rights Protection.

The Ministry of Education wishes to thank the many individuals, groups and other bodies involved – directly and indirectly – in publishing this textbook and the accompanying teacher guide.

Copyrighted materials used by permission of their owners. If you are the owner of copyrighted material not cited or improperly cited, please contact with the Ministry of Education, Head Office, Arat Kilo, (PO Box 1367), Addis Ababa, Ethiopia.

While every attempt has been made to trace and acknowledge copyright, the authors and publishers apologies for any accidental infringement where copyright has proved untraceable.

Developed and Printed by

STAR EDUCATIONAL BOOKS DISTRIBUTORS Pvt. Ltd.

24/4800, Bharat Ram Road, Daryaganj,

New Delhi – 110002, INDIA

and

ASTER NEGA PUBLISHING ENTERPRISE

P.O. Box 21073

ADDIS ABABA, ETHIOPIA

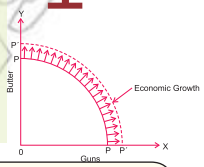
Under GEQIP Contract No. ET-MoE/GEQIP/IDA/NCB/G-04/09.

ISBN 978-99944-2-144-2

© MoE, FDR Ethiopia
Not to be republished

1

1



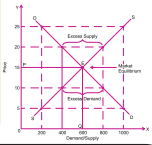
1.1 MEANING AND SCOPE OF ECONOMICS 3
1.2 METHODS OF STUDYING ECONOMIC PRINCIPLES 8
1.3 RESOURCE ALLOCATION 13
1.4 ECONOMIC SYSTEMS 22
1.5 DECISION MAKING UNITS AND CIRCULAR FLOWS OF ECONOMIC UNITS 30

- Unit Summary 39
- Review Exercise for Unit 1 42

2

á

49

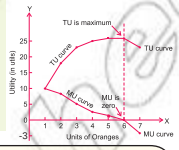


2.1 THEORY OF DEMAND 50
2.2 THEORY OF SUPPLY 64
2.3 MARKET EQUILIBRIUM 72
2.4 ELASTICITY OF DEMAND AND SUPPLY 84
2.5 ELASTICITY OF SUPPLY 100

- Unit Summary 109
- Review Exercise for Unit 2 113

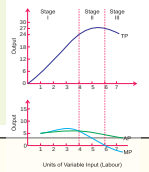
© MoE, FDRE, Ethiopia
Not to be republished

3 119



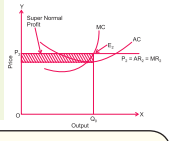
3.1 THE CONCEPT OF UTILITY 118
3.2 THE CARDINAL UTILITY THEORY 122
3.3 THE ORDINAL UTILITY THEORY: INDIFFERENCE CURVE APPROACH 128
Unit Summary 138
Review Exercise for Unit 3 139

4 143



4.1 THEORY OF PRODUCTION 144
4.2 THEORY OF COST 160
4.3 RELATIONSHIP BETWEEN PRODUCTION AND COST 170
Unit Summary 178
Review Exercise for Unit 4 181

5 187



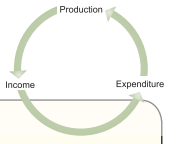
5.1 PERFECTLY COMPETITIVE MARKET 188
5.2 PURE MONOPOLY 201
5.3 MONOPOLISTICALLY COMPETITIVE MARKET 208
5.4 OLIGOPOLY MARKET 212
Unit Summary 215
Review Exercise for Unit 5 217

© MoE-FEDR Ethiopia Not to be republished

6 221

6.1 CONCERNS OF MACROECONOMICS 222
6.2 PROBLEMS OF MACROECONOMICS 225
- Unit Summary 246
- Review Exercise for Unit 6 249

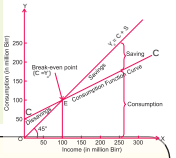
7 253



7.1 GDP GROSS DOMESTIC PRODUCT DEFINITION AND ITS MEASUREMENT 254
7.2 GDP GROSS DOMESTIC PRODUCT DEFINITION AND ITS MEASUREMENT 256
7.3 OTHER NATIONAL INCOME ACCOUNT 270
7.4 GDP AND INCOME DISTRIBUTION 273
- Unit Summary 277
- Review Exercise for Unit 7 279

8 283

á



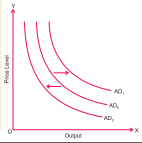
8.1 CONSUMPTION 284
8.2 SAVING 293
8.3 RELATIONSHIP BETWEEN CONSUMPTION AND SAVING 299
8.4 INVESTMENT 301
- Unit Summary 308
- Review Exercise for Unit 8 309

© MoE FDR Ethiopia
Not to be republished

9 313

9.1 INTERNATIONAL TRADE 314
9.2 BALANCE OF PAYMENTS 323
9.3 FOREIGN EXCHANGE RATES 328
- Unit Summary 332
- Review Exercise for Unit 9 334

10 337



10.1 DETERMINATION OF LEVELS OF OUTPUT, PRICES AND EMPLOYMENT 338
10.2 MACROECONOMIC POLICIES 342
- Unit Summary 347
- Review Exercise for Unit 10 348

Glossary 352

© MoE-EDR Ethiopia Not to be republished

1

Unit Objectives

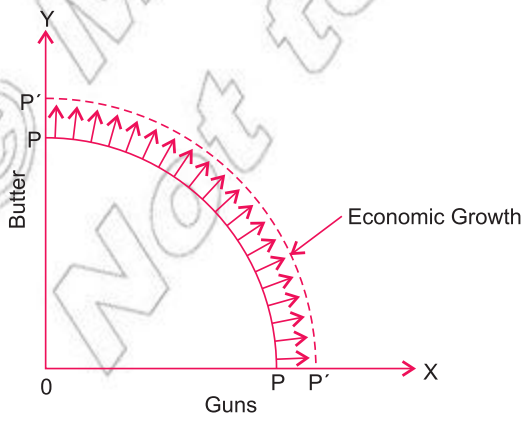
After completing this unit, you will be able to:

- understand the concept and nature of economics and analyze how resources are efficiently used in producing output;
- distinguish and evaluate different economic systems; and
- Appreciate the role of decision-making and interpret the circular flow model.

Main Contents

1.1 MEANING AND SCOPE OF ECONOMICS
1.2 METHODS OF STUDYING ECONOMIC PRINCIPLES
1.3 RESOURCE ALLOCATION
1.4 ECONOMIC SYSTEMS
1.5 DECISION-MAKING UNITS AND CIRCULAR FLOWS OF ECONOMIC UNITS

- Unit Summary
- Review Exercise



© Not to be republished

INTRODUCTION

The word economy comes from the Greek word for “one who manages a household”. Economics is a branch of the social sciences.

Economics is an important discipline, and its importance has increased in recent years in response to worldwide economic problems – particularly the global economic recession that started in December 2007. Even countries that have made rapid progress in areas like medicine, engineering, technology, electronics, and information technology are not free from economic problems. Problems like poverty, unemployment, inflation, recession, population explosion and so on are worldwide today. In order to understand such problems and to find solutions to them, an adequate knowledge of economics is required.

The science of economics in its current form is about two hundred years old. Adam Smith – generally known as the father of economics – brought out his famous book, ‘An Inquiry into the Nature and Causes of Wealth of Nations’, in the year 1776. Though many other economist writers expressed important economic ideas before Adam Smith, economics as a distinct subject started with his book. Economics was called political economy at this time.

We begin our tour through the fascinating world of economics by learning what economics is and how it can be defined. In the present introductory unit we discuss:

- its concept and nature;
- its scope;
- its classification into microeconomics and macroeconomics;
- its role in efficient utilisation of available resources;
- different types of economic systems; and
- the features and characteristics of the major decision-making units of an economy.

1.1 MEANING AND SCOPE OF ECONOMICS

At the end of this section, you will be able to:

- define the term economics ; and
- identify the difference between microeconomics and macroeconomics.

Key Terms and Concepts

- Economics
- Microeconomics
- Macroeconomics
- Resources
- Capitalism
- Mixed economy
- Scarcity
- Economic growth
- Command economy
- Entrepreneur

Start-up Activity

Discuss on the meanses to accord scarcity of resources with rapid population growth, so that it is possible to satisfy Human wants.

Definitions of Economics

The definition of economics has evolved over time. Economic theory has developed significantly, and new subjects have been added to the field. The definition of economics is ongoing, and it is under refinement mainly in areas such as:

- Wealth definition
- Welfare definition
- Scarcity definition

Every definition is vulnerable to objections. However, let us consider current ideas of what economics is all about and what economics as a subject is considered to be. In this regard, let us consider some universal truths

- Human wants are unlimited.
- Resources (means) to satisfy them are scarce (limited).
- Resources have alternative uses.

© MoE Not to be republished

Definition:

Economics is a study of problems regarding choices that must be made due to scarcity of resources. It examines how the scarce resources can be used for the maximum fulfilment of human wants. Economics is a study of how society manages scarce resources.

The Nature of Economics

We have observed that the variety in the definitions of economics reflects the changing views of economists over time. Some economists have treated economics as a science, and others consider it to be an art.

Economics as a Science

Science produces a systematic and organised knowledge that correlates causes and effects. This knowledge can be called a knowledge of "what is". In economics, various facts are systematically collected, classified, analysed and interpreted to make predictions for the future, and it is in this sense that economics can be considered to be a science.

Economics as an Art

One important definition of art is a technique or a way of doing or achieving something While dealing with problems like unemployment, poverty and inflation, economics presents principles and methods by which these problems can be solved. Thus economics not only investigates the nature and causes of an economic problem but also sets guidelines for its solution. On this basis, we can consider economics to be an art.

Branches of Economics

The field and scope of economics is expanding rapidly and has come to include a vast range of topics and issues. In the recent past, many new branches of the subject have developed, including development economics, welfare economics, environmental economics, and so on. However, the core of modern economics is formed by its two major branches: microeconomics and macroeconomics

© MoE, FDRE Ethiopia Not to be republished

Microeconomics

Primarily deals with the behaviour of individual economic units. For instance, economic activities and studies concerning a consumer, a producer, a firm or industry, individual income, the determination of product price and factor price, etc. come under the scope of microeconomics. The central problem of microeconomics is the problem of allocation of resources or the problem of price-determination. It is, therefore, termed as price theory. Demand and supply are the main tools of analysis in microeconomics. Adam Smith is usually considered to be the founder of the field of microeconomics.

Macroeconomics

Deals with aggregates or averages covering an entire economy. For instance, total employment, national income, national output, total investments, total consumption, total savings, aggregate supply, aggregate demand and general price level, wage level and cost structure come under the scope of macroeconomics. In other words, it is an aggregative economics that examines the interrelations among various aggregates, their determination and the causes of fluctuations in them.

The central problem of macroeconomics is the problem of determining income and employment. Therefore, it is known as the theory of income and employment or simply income analysis. Aggregate demand and aggregate supply are the main tools of analysis in macroeconomics. The credit for the evolution of macroeconomics as a field of economics goes to Lord J. M. Keynes.

Distinction between Microeconomics and Macroeconomics

Microeconomics is the study of individual economic units of an economy such as individual households, individual firms or industries. On the other hand, macroeconomics is the study of an economy as a whole, and its focus is the study of broad economy-wide aggregates. For example, when we study the price determination of a commodity in a market, our study is micor-analysis and is treated by microeconmics, but if we study the trend of the general price of commodities over time in a country, our analysis macro-analysis and is treated by macroeconomics. Major points of distinction between these two branches of economics are listed in Table 1.1

© MoE FDRE Ethiopia Not to be republished

Table 1.1

Microeconomics	Macroeconomics
1 It studies individual economic units of an economy.	1 It studies an economy as a whole and its aggregates.
2 It deals with individual income, individual prices, individual outputs, etc.	2 It deals with aggregates like national income, general price level and national output.
3 Its central problem is price determination and allocation of resources.	3 Its central problem is determination of level of income and employment.
4 Its main tools are the demand and supply of particular commodities and factors.	4 Its main tools are aggregate demand and aggregate supply of an economy as a whole.
5 It helps to solve the central problem of 'what, how and for whom to produce' in an economy.	5 It helps to solve the central problem of 'full employment of resources in the economy.'
6 It discusses how the equilibrium of a consumer, a producer or an industry is attained.	6 It is concerned with the determination of equilibrium levels of income and employment.
7 Examples are: Individual income, individual savings, individual prices, an individual firm's output, individual consumption, individual expenditure, etc.	7 Examples are: national income, national savings, general price level, national output, aggregate consumption expenditure, aggregate employment, etc.

Usefulness and Significance of Economics

Economics is an extremely useful subject, and its study and knowledge has acquired greater importance in recent times. As you know, economic problems are being faced today by an increasing number of countries all over the world, and this is one reason behind the growing importance of economics. Some of the advantages of studying economics are:

- Economics helps us to understand certain problems and questions affecting individuals and families.

  For example,

  - the types of jobs that are available,
  - the level of wages in industries,
  - the effect of price rises on peoples' standard of living.

- Economics explains problems and questions that affect society and the state as a whole, and it suggests suitable solutions for them.

For example,

- what are the causes of unemployment and how can we reduce it?
- What causes price rises?
- What policies should the government adopt to control inflation?

- Economics examines the actions and behaviours of different types of people under different circumstances.

For example: employees, investors and speculators.

- Economics explains the causes of fluctuations in economic activity and helps us to understand business trends.
- Economics helps us to understand and solve crucial problems like poverty and unemployment.
- The study of economics is useful for economic planning and economic development.
- Economics helps us to understand and participate in international trade by examining the theory and practice of exports, imports, comparative costs, etc.
- Economics helps us to understand how different economic systems function.
- The study of economics helps us to understand how social welfare can be achieved through material means.

In addition, the study of economics develops logical thinking and analytical attitudes, and it enhances our faculties of observation and judgement.

Therefore, we may conclude that the study and knowledge of economics is useful and important to each of us and to society as a whole.

Activity 1.1

Answer these questions in a brainstorming session with the class:

1 Describe the nature of economics. Should it be treated as a science or an art?

2 How do economists make assumptions?

1.2 METHODS OF STUDYING ECONOMIC PRINCIPLES

At the end of this section, you will be able to:

- examine the methods of studying economics.

Key Terms and Concepts

- Deductive method
- Inductive method
- Hypothesis
- Data processing
- Model
- Positive economics
- Normative economics

Start-up Activity

Discuss the following statement: "Like any other discipline, economics should be governed by laws"

Every science develops hypotheses, generalizations, principles, laws, and theories that explain the phenomena it studies. In order to develop these generalizations and theories, the science must have a methodology. This section briefly describes the kinds of methods usually adopted to study relationships between economic variables. It also considers both the role of value judgements in economic analysis and the general nature of economic laws.

Deductive and Inductive Methods

Deductive Method

Deductive method is a method of reasoning which enables one to reach at a particular conclusion from a general statement or assumption.

Most economic theories have been constructed through the deductive method. The principal steps involved in the deductive method are:

I Identifying the Problem and its Variables

In any scientific enquiry, the analyst must have a clear idea of the problem to be investigated. He or she must also identify the significant variables that interact relative to the problem. The final laws and theories will be based on these understandings.

II Defining Technical Terms and Making Assumptions

The next step in the process is to accurately and precisely define the various technical terms to be used in the analysis and to clearly state the assumptions on which the final theories and laws will be based.

III Developing Hypotheses through Logical Deduction

The next step is deducing hypotheses from the assumptions stated in Step (II). The hypotheses propose cause-and-effect relationships between the variables that are related to the problem identified in Step (I).

In this process, the analyst uses logical reasoning to derive the hypotheses from the assumptions defined in Step (II).

IV Testing or Verifying Hypotheses

The hypotheses obtained in Step (III) must be verified before they can be established as theories of economics. On the basis of a hypothesis, economists make predictions. To verify the hypothesis, these predictions are tested.

V Comparing Predictions with Facts

If, on testing, the predictions of a hypothesis are found to be in agreement with relevant facts in the real world, then a useful and correct theory has been constructed and developed. However, if predictions of the hypothesis are found to be in conflict with the facts, then two courses are open to the theorist. In the first, the theory is discarded in favour of a superior alternative. In the second, the process of constructing a theory is re-started by modifying the assumptions.

Inductive Method

On the other hand, inductive method is a process of reasoning from a part to whole, from particular to generals or from the individual to the general.

The inductive method develops economic theories on the basis of observations and experiments. In this method, detailed data are collected with regard to the economic phenomenon. Efforts are then made to arrive at hypothesis based on the observations and data collected.

Note that the number of observations must be large in order to yield valid economic theories.

© NCERT Not to be republished

Various steps are gone through in developing economic theories through the inductive method. As in the deductive approach, the first step is to identify the problem, and the second step is defining technical terms and variables related to the problem. The next step is specific to the inductive method: collecting data about the variables related to the problem and doing some preliminary thinking about possible functional relationships between the variables.

The next important step in this method is processing the collected data and determining which of the relationships considered in the previous step hold true. Based on these results, the analyst develops hypotheses, which can then be refined and tested statistically.

After creating a hypothesis, the analyst bases predictions on it and tests the predictions under real-life economic conditions. If the predictions agree with the actual behaviour of the economy, then a new reliable theory has been developed.

However, if the predictions are in conflict with the actual behaviour of the economy, either the theory is discarded or fresh efforts are made to modify and refine it by collecting more data and processing them.

Integrated Deductive and Inductive Methods

Which is more appropriate for developing economic theories and principles – is it the deductive or the inductive approach? The modern viewpoint in this regard is that both are needed for the proper development of scientific economic theories. Indeed, the two are complementary rather than competitive. Modern economists begin by developing economic hypotheses through logical deduction and then empirically test them through statistical or econometric methods.

Model Building in Economics

Economists construct analytic economic models to help explain the behaviour of an individual consumer, producer or industry or of the economy as a whole. An economic model usually consists of a set of equations that express relationships between variables that are relevant to the problem under investigation. Each equation attempts to explain the behaviour of one variable, seeking to establish cause and effect relationships regarding it.

Note that causation does not always run only in one direction. There are mutual relationships among variables: one variable influences other variables and is,

© MoE-FDRE Ethiopia
Not to be republished

in turn, influenced by them. For instance, consumption depends upon income, and also consumption influences income through its participation in aggregate demand. Because of this mutuality in economic systems, the values of different variables are determined simultaneously, and models that involve more than one equation attempt to solve these equations simultaneously.

Note also that a model does not represent its part of the real world in entirety. The model represents only its main significant features. This is because, while constructing a model, we must incorporate some unrealistic assumptions in order to simplify the situation enough to be able to construct a model of it.

Definition:

A model is an abstraction of the real world.

Why are economists interested in building models? One of the most important strategies of economists is the economic model. A model is a simplified theory or a simplified picture of what something is like or how something works. Simple models can often be constructed that reduce complex situations to their most basic elements. Economic models include function, schedule and graph.

Economic models are built for purposes of analysis and prediction.

By analysiswe mean determining how adequately we can explain the behaviour of an economic agent such as a consumer, a producer or the economic system as whole. Based on a set of assumptions, we use deductive logic to develop laws of economics that describe the behaviour of economic agents and that have general application. Prediction implies the ability of a model to forecast the effects of changes of some magnitude in the economy.

Positive versus Normative Economics: The Role of Value Judgement in Economic Analysis

Positive Economics (Economics as a science)

Definition:

Positive economics is concerned with explaining what is. In other words, it develops theories and laws to explain observed economic phenomena.

Example: Minimum-wage laws cause unemployment.

Normative Economics (Economics as an art)

Definition:

Normative economics includes concerns of what should be, and it involves value Judgement.

Example: The government should raise the minimum wage.

Laws and theories of positive economics do not include value judgements since positive economics is concerned only with facts, which are, in principle, either true or false. Positive economics deals with analysis of how the economy operates, whereas normative economics deals with analysis of the benefit of economic policies to society. Robbins emphasised that economics should be treated as a positive science only, and he contended that it should not become normative in character. In contrast, Professor Pigou argued that economists should not refrain from making value judgements.

The Nature of Economic Laws

Economic laws are usually stated based on ceteris paribus Ceteris paribus a Latin translated as "other things being equal," used as a reminder that all variables other than the ones being studied are assumed to be constant.

Economic laws are also known as economic generalisations and economic principles Economic laws describe how man behaves as a producer or as a consumer. Such laws are also concerned with how the economic system works and operates. Here are some of the main features of economic laws:

I Economic laws are a lot like statements of tendencies

Economic laws are very close to being statements of tendencies, unlike the laws of the physical sciences, which are quite exact, precise and definite. Because of their exactness, the laws of the physical sciences can predict the course of events, but the laws of economics lack this absolute predictive quality.

II Economic laws are conditional.

Laws of economics are conditional and are associated with a number of qualifications and assumptions. For example, the law of demand states that demand for a commodity rises with a fall in its price, provided that other things remain the same

© MoE FDRE Not to be republished

III Economic laws are scientific in nature.

All scientific laws, including economic laws, establish relationships between cause and effect. For example, according to the law of demand, when the price of a commodity falls, the quantity demanded of it increases. Here, the fall in the price is the cause, and the rise in the quantity demanded is the effect.

IV Economic laws are not completely exact and definite.

Laws of economics are less exact and definite than are the laws of the physical sciences. For example, the law of gravitation is so exact and definite that we can exactly calculate and measure the movements of the solar system. But this is not true for economic laws. We cannot say exactly what the economic behaviour of a person will be under certain conditions. We can only say that he or she would tend to behave in a particular manner.

V Economic laws are not permanent and general.

Unlike the laws of the physical sciences, economic laws are not permanent and general. For example, economic laws that apply to the hunting and pastoral stages of the evolution of economic life do not apply to the agricultural and industrial stages. Similarly, the economic laws relevant to a capitalist system do not apply to a socialist system. Also, some laws of economics that are valid for developed countries might not be valid for developing countries.

1.3 RESOURCE ALLOCATION

At the end of this section, you will be able to:

- define concepts like scarcity, opportunity cost, choice and efficiency;
- construct production possibility curve; and
- distinguish the difference among economic resources, free resources and shortage of resources.

Key Terms and Concepts

- Opportunity cost
- Economic resources
- Free resources
- PP curve
- PPF
- Economic growth

Startup Activity

What are the central problems of Economics?

As you know, the scarcity of resources in relation to the multiplicity of human wants is a basic fact of life. Every household, producer and economy is faced with the problem of scarcity of resources, natural as well as man-made. Therefore, it is very important that resources are used as efficiently as possible. To that end, they must be allocated properly among the available choices. The following section presents some basic economic concepts.

Some Basic Concepts of Economics

Economy

Human beings require various goods and services. These goods and services are produced through production units like factories, shops, offices, farms, and railways. These units also enable the people to earn income. In combination, these institutions and organisations may be collectively called an economy. We may define an economy as a system which provides people with the means to work, and earn a living.

The Economic Problem

Human wants are unlimited, and productive resources such as land, raw materials, capital, and equipment that are used to produce goods and services to satisfy these wants are scarce. With wants being unlimited and resources being limited, we cannot satisfy all of our wants. This gives rise to the problem of how to use scarce resources to attain maximum satisfaction. This is generally called the economic problem. We may say, the economic problem is concerned with the uses of scarce resources among alternative human wants and in using these resources towards the end of satisfying wants as fully as possible.

Since all wants cannot be satisfied, due to scarcity of resources, we have to make choices. The economic problem is also called the problem of choice.

Scarcity

The economic problem is the problem of scarcity. In daily life, scarcity means acute shortage of a certain commodity, but in economics, it means limitation in the supply of a commodity relative to the need for it. Similarly, resources are said to be scarce when they are not available in sufficient quantity to satisfy all human wants. In other words, resources are scarce when the demand for them exceeds their availability. And it is the scarcity of resources that creates economic problems. In other words, if resources were available in full abundance, unlimited goods and services would be produced to satisfy unlimited human wants and there would be no economic problems.

© MoE-FDRE Ethiopia Not to be republished

Choice

With limited resources, we cannot satisfy all our wants, and thus we make choices. Like an individual, a society also must make choices between various alternatives. The economic problem is called a problem of choice because the economy has to make choices between various types of goods that can be produced with the given resources. For example, it might choose between goods for civil use or military use, or might make a choice between luxury goods and necessity goods. Choice, in turn, implies cost or, we may say, it involves sacrifice. Because of the scarcity of resources, our choice of one thing means the sacrifice of another. Thus, when we make a choice for one thing, it is the cost of some other thing. This leads us to another concept in economics, known as opportunity cost

Opportunity Cost

Definition:

The **opportunity cost** of a commodity is the amount of other commodities that must be forgone in order to produce the first.

In this context, the cost of producing a quantity of a commodity is measured in terms of the quantity of some other commodity that could have been obtained instead. The **opportunity cost** arises because of the problem of scarcity of resources and the fact that resources have alternative uses. Hence, when we use resources in the production of one commodity, we must forgo some amounts of other commodities that could have been produced with these same resources. For example, given resources may be used for the production of cloth or of bread. If a given amount of resources can produce either 1 metre of cloth or 20 loaves of bread, then the cost of 1 metre of cloth is the 20 loaves of bread that must be sacrificed in order to produce the metre of cloth.

Efficiency (Economising of Resources)

Economising resources means making the best use of available resources. In other words, it implies optimum utilisation of existing resources. The need to economise resources arises because resources are scarce and have different uses. Usually the demand for a resource exceeds, its availability, and this compels the economy to utilise its available resources in the most efficient manner in order to get maximum production and satisfaction.

Efficient Use of Resources

Definition:

Efficiency: The condition that exists when society gets the most that it can from scarce resources.

Since resources are scarce or limited, they should be used fully and in an efficient manner. The problem of efficiency in the use of resources exists in all economies. At times, certain forces build up as a result of which the full utilisation of available resources is not possible. The unused capacity to produce goes to waste. The economy must identify such forces and take remedial action.

Full utilisation of available resources has taken place when no re-allocation of resources for increasing the production of some goods can be made without reducing the production of other goods

Resources

There are two types of resources: free resources and economic resources

Free Resources

Resources that are free gifts of nature and that are unlimited in supply, and do not have prices are known as free resources. For example, air, sunshine, and a mountain stream.

Scarcity Vs. Shortage

These two words are often used interchangeably, but they mean different concepts in Economics. Scarcity means that society has limited resources and therefore, can not produce all the goods and services people wish to have. Scarcity is a universal problem that faces all societies because there are not enough resources to produce everything people want.

A shortage is a situation in which the quantity demanded is greater than the quantity supplied. Shortages occur when producers are not or can not offer goods or services at the current price.

Economic Resources

Resources that are scarce or limited and that have prices are known as economic resources for example, land, buildings, and machinery.

Broadly speaking, we can divide economic resources into four categories. Land, labour, capital, and entrepreneurship.

© MoE FDR Ethiopia Not to be republished

Land: In ordinary language, land means the outer surface of the earth. However, in economics the meaning of the term land is more comprehensive. Here, it includes all natural wealth that exists on or under the surface, including features such as rivers, soil, forests, mines, and deserts. The reward for land is rent.

Labour: By labour, we mean all mental and physical labour which is helpful in the production of goods and services. In this way, services of a wide variety of people, such as lawyers, doctors, farm workers and factory workers, come within the category of labour. In short, all labour – mental and physical – that is done in order to earn money is called labour. Work that is performed for other reasons – for example, to provide a social service, or for entertainment, love, or affection – is not labour in economic terms. The reward for labor is wage and salary.

Capital: All man-made goods that are used for the further production of wealth are included in capital. Thus, capital is the man-made material sources of production. Alternatively, all man-made aids to production that are not consumed for their own sake are categorized as capital. Some examples are machines, tools, buildings, roads, bridges, raw material, trucks, and factories. The reward for capital is interest.

Entrepreneurship: entrepreneurship is the taking of production risks and business creation. As described later in this unit, an entrepreneur is a person who organizes the other resources of production and undertakes the risks and uncertainties involved in production. The reward for interpreneurship is profit.

Economic Growth

The question of whether an economy's capacity to produce goods and services is growing, stagnating, or dropping over time is faced by all economies. Every economy must explore its growth potential in order to enable increases in its level of production. Economic growth or growth of resources can be achieved in different ways, including technological advancement and the production of new types of goods. Rapid economic growth is necessary for raising the living standard of any economy's population. Economic growth may be defined as increase over time in per-capita output of material goods

The Production Possibility Curve (PPC)

The production possibility curve (PPC) is an important tool of modern economics for explaining and interpreting basic economic problems.

© NIOS FOR PERSONAL USE ONLY Not to be republished

Definition:

A production possibility curve (PPC) shows us all possible combinations of production quantities of multiple products. The production quantities represent maximum possible output and are based on full and efficient use of currently available resources and of the current production technology.

Let's now consider a hypothetical production situation and the PPC associated with it. Note that all production possibility curves assume full and efficient use of:

- current available resources required to produce the products
- the current technology used to produce the products

For the sake of simplicity, let us assume that, with the given resources, only two goods – guns and butter – can be produced.

Production Possibility Schedule

Table 1.2 is a production possibility schedule that shows various production trade-offs between units of guns versus units of butter.

Table 1.2 Hypothetical production possibility schedule for guns and butter

Production possibilities	Units of guns	Units of butter
A	0	100
B	1	90
C	2	70
D	3	40
E	4	0

Table 1.2 shows five possible combinations of production quantities – A through E. As shown for scenario A, if all the given resources are used to produce butter, 100 units of butter can be produced. On the other hand, as shown at point E, when all the resources are used to produce guns, 4 units of guns can be produced. In between these two scenarios, many other possible combinations of production quantities exist, and we can consider as many or as few of them as we choose. In our case, we examine those of points B, C, and D.

Production Possibility Curve

Now let's examine Figure 1.1 which presents the production possibility curve for the schedule in Table 1.2. As for all production possibility curves, the curve in Figure 1.1 illustrates varying production combinations of specific products.

In our case, they are guns and butter. Study Points A-E on the curve and observe their correspondence with the data in Table 1.2.

NOTE

In our example , there are only two products. However, the concepts and procedures for production possibility curves can involve any number of products.

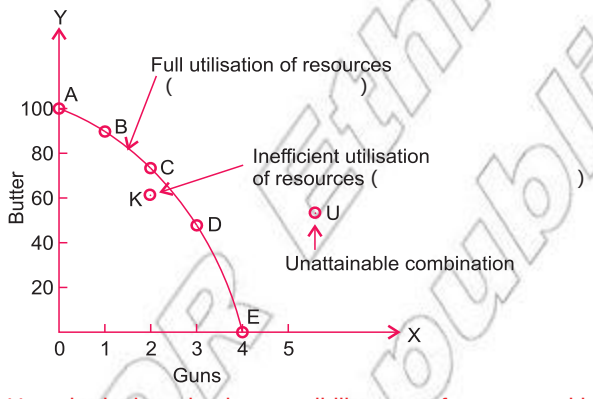


Figure 1.1: Hypothetical production possibility curve for guns and butter

Now consider the trade-offs illustrated in Figure 1.1. As we move from point to point on the curve (from scenario A through scenario E), we take more and more resources from the production of butter and devote them to the production of guns. In other words, we give up units of butter in order to have some more units of guns.

In order to understand the relationship between production possibility curves and basic economic problems, study the following information about our hypothetical production possibility curve:

i Points A, B, C, D, and E on the curve show five production possibilities for units of guns versus units of butter, illustrating the trade-offs that result from increasing one product over the other. To decide what to produce and the quantities of each item to produce, we assess these trade-offs relative to the economy's goals.

ii Regarding efficiency in production technique and in use of resources.

If a production point lies anywhere inside the curve, inefficiency and waste are occurring. Consider Point K, which lies inside the production possibility curve. Point K represents the production of two units of guns with 60 units

© MoE-FDRE Ethiopia
Not to be republished

of butter. However, Point C, which falls on the curve itself, tells us that greater production is possible – at full resource utilization, we can produce 70 units of butter (rather than 60) as well as the same two units of guns.

Therefore, if the production is at point K (or at any point inside the curve), it is inefficient in its use of the available resources, technology level, or both.

In contrast, any production point shown outside of the curve – such as U – represents an unattainable combination of goods, given current conditions of resources and technology.

iii If the economy's production capacity increases, reflecting economic growth, the production possibility curve shifts outward, to the right, as shown in Figure 1.2, showing that greater quantities of both types of goods can be produced. Economic growth has led to increased available resources, higher technology levels, or both.

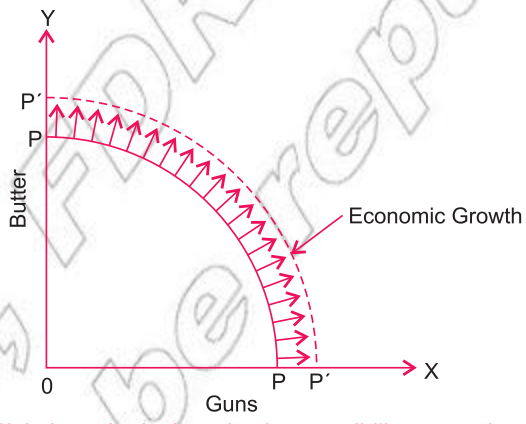


Figure 1.2: Shift in hypothetical production possibility curve due to economic growth

Activity 1.2

With your economics workgroup, perform the following task and question:

1 Visit a factory in your locality and try to establish the PPC of the firm.
2 What causes a PPC to shift outwards?
3 Can an economic model exactly explain/describe reality?

Opportunity Cost and PPC

Recall that the opportunity cost of a commodity is the amount of other commodities that must be forgone in order to produce the first.

Let us explain the concept of opportunity cost by using a PPC. For the curve in Figure 1.3, assume that the economy is producing at Point C. It indicates production of 70 units of butter and 2 units of guns. Now assume that the economy needs one more unit of guns. To make this change, production must move to Point D, which shows that, when the economy increases gun production by one unit, it must forgo 30 units of butter. In other words, 30 units of butter is the opportunity cost of one unit of guns.

The opportunity cost of a commodity is the amount of another commodity that must be forgone in order to produce the first.

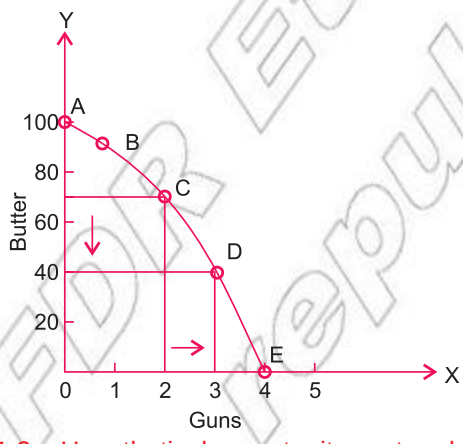


Figure 1.3: Hypothetical opportunity cost and PPC

Generally, the opportunity cost of producing a commodity is calculated as follows:

$$\text{Opportunity cost of a commodity} = \frac{\text{the amount of the next-best alternative given up}}{\text{the amount of the commodity produced}}$$

Shape of the PPC

Observe that a PPC is a downward sloping curve. That shape is because, as we produce more of one commodity (guns), the amount of other commodity produced (butter) is decreased. Also, with the production of more and more guns, the amount of butter given up for every additional unit of guns increase. As you can see, this means that the opportunity cost of guns increases. As a result, PPC curves slope down because increased production of one commodity is associated with lower production of the other. Finally, the PPC curves becomes concave to the origin, mainly because of increasing opportunity cost.

© MoE-FDRE Ethiopia Not to be republished

Activity 1.3

Perform these tasks:

1 Construct a PPC that shows your grades (marks) in economics and in maths so far this year.

2 Calculate the opportunity cost of your grades for the two subjects.

1.4 ECONOMIC SYSTEMS

At the end of this section, you will be able to:

- express what economic system is; and
- compare and contrast the three economic systems.

Key Terms and Concepts

- Capitalism
- Capitalistic economy
- Command economy
- Mixed economy
- Percapita income

Startup Activity

How do you describe decentralisation of economic power? Enumerate some of its advantages by considering the economic power of the regional states of FDRE.

Every modern society faces certain basic economic problems, such as:

- What goods and services should be produced and in what quantity?
- How and where should production be organized so as to produce the required goods and services most efficiently?
- How should the resulting output be distributed?

Basic Economic Questions

Economic problems faced by an economic system due to scarcity of resources are known as **basic economic problems**. These problems are common to all economic systems. They are also known as **central problems of an economy**

The three central/basic economic questions are:

- What to produce?
- How to produce?
- For whom to produce?

In addition to these, every economy is faced with other problems like:

- How most efficiently utilise resources.
- How to accelerate the rate of economic growth.

What to Produce?

This problem is also known as the problem of allocation of resources. It implies that every economy must decide which goods and in what quantities are to be produced. The economy must make choices such as these: consumption goods versus capital goods, civil goods, versus military goods, and necessity goods versus luxury goods. As we know that the resources to produce any of these goods are limited, we must reduce the production of one type of goods if we want more of another type. Generally the final choice of any economy is a combination of the various types of goods, but the exact nature of the combination depends upon the specific circumstances and objectives of the economy.

How to Produce?

This problem is also known as the problem of choice of technique. Once an economy has reached a decision regarding the types of goods to be produced, and has determined their respective quantities, the economy must decide how to produce them, choosing between alternative methods or techniques of production. For example, cotton cloth can be produced with hand looms, power looms, or automatic looms. Similarly, wheat can be grown with primitive tools and manual labour, or with modern machinery and little labour.

Broadly speaking, the various techniques of production can be classified into two groups: labour-intensive techniques and capital-intensive techniques. A labour-intensive technique involves the use of more labour, relative to capital, per unit of output. A capital-intensive technique involves the use of more capital, relative to labour, per unit of output. The choice between different techniques depends on the available supplies of different factors of production and their relative prices. Making good choices is essential for making the best possible use of limited resources to produce maximum amounts of goods and services.

© NCERT not to be republished

For Whom to Produce?

This problem is also known as the problem of distribution of national product. It relates to how a material product is to be distributed among the members of a society. National product is the sum total of all the goods and services produced in an economy during a particular period.

The economy must decide, for example, whether to produce for the benefit of the few rich people or for the large number of poor people. An economy that wants to benefit the maximum number of persons would first try to produce the necessities of the whole population and then to proceed to the production of luxury goods.

All these and other fundamental economic problems center around human needs and wants. Many human efforts in society are directed towards the production of goods and services to satisfy human needs and wants. These human efforts result in economic activities that occur within the framework of an economic system. An economic system may thus be defined as the legal and institutional framework within which economic activities take place.

It can also be referred to as an organisation for the purpose of satisfying the peoples' needs by using available means of production.

We shall now study different types of economic systems, classified on the basis of ownership of resources. These are:

- Capitalistic economy
- Command economy
- Mixed economy

Capitalistic Economy (Capitalism)

Capitalism is the oldest formal economic system in the world. It became widespread in the middle of the 19th century. In this economic system, all means of production are privately owned, and production takes place at the initiative of individual private entrepreneurs who work mainly for private profit. Government intervention in the economy is minimal. This system is also called free market economy or market system or laissez faire.

Main Features of Capitalistic Economy

- The Right to Private Property: The right to private property is a fundamental feature of a capitalist economy. As part of that principle, economic or productive factors such as land, factories, machinery, mines etc. are under private ownership.

- Freedom of Enterprise: Each individual is free to engage in any economic activity that he or she considers to be desirable, profitable, etc.
- Freedom of Choice by Consumers: Consumers can buy the goods and services that suit their tastes and preferences. Producers produce goods in accordance with the wishes of the consumers. This is known as the principle of consumer sovereignty.
- 3 U R ¿ W 0 R W L Y H: Entrepreneurs, in their productive activity, are guided by the motive of profit-making.
- Competition: In a capitalist economy, competition exists among sellers or producers of similar goods to attract customers. Among buyers, there is competition to obtain goods. Among workers, the competition is to get jobs. Among employers, it is to get workers and investment funds.
- Price Mechanism: All basic economic problems are solved through the price mechanism.
- Minor Role of Government: The government does not interfere in day-to-day economic activities and confines itself to defence and maintenance of law and order.
- Self-Interest: Each individual is guided by self-interest and motivated by the desire for economic gain.
- Inequalities of Income: There is a wide economic gap between the rich and the poor.
- Existence of negative externalities: A negative externality is the harm, cost, or inconvenience suffered by a third party because of actions by others. In capitalistic economy, decision of firms may result in negative externalities against another firm or society in general.

Advantages of Capitalistic Economy

- Flexibility or Adaptability: It successfully adapts itself to changing environments.
- Decentralisation of Economic Power: Market mechanisms work as a decentralising force against the concentration of economic power.
- Increase in Per-Capita Income and Standard of Living: Rapid growth in levels of production and income leads to higher per-capita income and standards of living.
- New Types of Consumer Goods: A variety of new consumer goods are developed and produced at large scale.
- Growth of Entrepreneurship: Profit motive creates and supports new entrepreneurial skills and approaches.
- Optimum Utilisation of Productive Resources: Full utilisation of productive resources is possible due to innovations and technological progress.

- High Rate of Capital Formation: The right to private property helps in capital formation.
- Reward According to Ability: The most efficient and dynamic entrepreneurs are amply rewarded, while those who are inefficient are eliminated from the field.

Disadvantages of Capitalistic Economy

- Inequality of Income: Capitalism promotes economic inequalities and creates social imbalance.
- Too Much Waste: There is considerable waste in capitalism due to high levels of competition.
- Unbalanced Economic Activity: As there is no check on the economic system, the economy can develop in an unbalanced way in terms of different geographic regions and different sections of society.
- Emphasis on Materialism: Capitalism promotes materialism. Every activity is motivated by monetary considerations and might not be related to human welfare.
- Exploitation of Labour: In a capitalistic economy, exploitation of labour (for example by paying low wages) is common.
- Trade Cycles of Economic Booms and Depressions: Because, at the national level, saving, investment and production are unplanned and uncoordinated, overproduction and underproduction can occur.
- Negative externalities: are problems in capitalistics economy where profit maximization is the main objective of firms. If economic makes sense for a firm to force others to pay the leal of negative externalities such as pollution.

Command Economy (Socialism)

Command economy is also known as socialistic economy. In it, the economic institutions that are engaged in production and distribution are owned and controlled by the state and are put to use under a centralised plan. Beginning with Russia (in 1917), many countries of the world, including China, Vietnam, former East Germany, Poland, Hungry, and Cuba, adopted socialism. Many of them adopted this system after the Second World War. However in the recent past, socialism has lost its popularity and most of the socialist countries are trying free market economies.

H.D. Dickenson defines socialism as "an economic organisation of society in which the material means of production are owned by the whole community

according to a general economic plan, all members being entitled to benefit from the results of such socialised planned production on the basis of equal rights.

Main Features of Command Economy

- Collective Ownership: All means of production are owned by the society as a whole, and there is no right to private property.
- Clear Social and Economic Objectives: A command economy has clear objectives and attains them through conscious efforts. The socio-economic goals might include rapid industrialisation, raising the standard of living of the weaker sections of the society, etc.
- Central Economic Planning: Planning for resource allocation is performed by the controlling authority according to given socio-economic goals.
- Government strong role: Government has complete control over all economic activities.
- Maximum Social Welfare: Command economy aims at maximising social welfare and does not allow the exploitation of labour.
- Relative Equality of Incomes: Private property does not exist in a command economy, the profit motive is absent, and there are no opportunities for accumulation of wealth. All these factors lead to greater equality in income distribution, in comparison with capitalism.

Advantages of Command Economy

- Best Utilisation of Resources: Since a command economy is a planned economy, it can ensure the best utilisation of economic resources.
- Absence of Wasteful Competition: There is no place for wasteful use of productive resources through unhealthy competition.
- Smooth Working of the Economy: A command economy faces no cyclic fluctuations in business activity and works smoothly. There are no chances of overproduction or underproduction.
- Balanced Economic Growth: Allocation of resources through centralised planning leads to balanced economic development. Different regions and different sectors of the economy can develop equally.
- Elimination of Private Monopolies and Inequalities: Command economies avoid the major evils of capitalism such as inequality of income and wealth, private monopolies, and concentration of economic, political and social power.

Disadvantages of Command Economy

- Absence of Automatic Price Determination: Since all economic activities are controlled by the government, there is no automatic price mechanism.

- $ E V H Q F H R I , Q F H Q W L Y H V I R U The entire system depends on bureaucrats who are generally considered inefficient in running businesses. There is no financial incentive for hard work and efficiency. The economy grows at a relatively slow rate.
- Lack of Economic Freedom:Economic freedom for consumers, producers, investors, and employers is totally absent, and all economic powers are concentrated in the hands of the government.
- Red-Tapism:Red-tapism is widely prevalent in a command economy because all decisions are made by government officials.

Mixed Economy

A mixed economy is an attempt to combine the advantages of both the capitalistic economy and the command economy. It incorporates some of the features of both and allows private and public sectors to co-exist.

Definition:

A mixed economy is an economy containing the characteristics of both capitalism and socialism: a combination of private and public ownership of the means of production, with some measures of control by the government.

The concept of mixed economy is of recent origin and many developing countries have adopted the system of mixed economy.

Main Features of Mixed Economy

- Co-existence of Public and Private Sectors:Public and private sectors co-exist in this system. Their respective roles and aims are well-defined. Industries of national and strategic importance, such as heavy and basic industry, defence production, power generation, etc. are set up in the public sector, whereas consumer-goods industry and small-scale industry are developed through the private sector.
- Economic Welfare:Economic welfare is the most important criterion of the success of a mixed economy. The public sector tries to remove regional imbalances, provides large employment opportunities and seeks economic welfare through its price policy. Government control over the private sector leads to economic welfare of society at large.
- Economic Planning: The government uses instruments of economic planning to achieve co-ordinated rapid economic development, making use of both the private and the public sector.

- **Price Mechanism:** The price mechanism operates for goods produced in the private sector, but not for essential commodities and goods produced in the public sector. Those prices are defined and regulated by the government.
- **Economic Equality:** Private property is allowed, but rules exist to prevent concentration of wealth. Limits are fixed for owning land and property. Progressive taxation, concessions and subsides are implemented to achieve economic equality.

Advantages of Mixed Economy

- **Private Property and Profit Motive:** All the advantages of a capitalistic economy, such as the right to private property, motivation through the profit motive, and control of economic activity through the price mechanism, are available in a mixed economy. At the same time, government control ensures that they do not lead to exploitation.
- **Adequate Freedom:** Mixed economies allow adequate freedom to different economic units such as consumers, employees, producers, and investors.
- **Rapid and Planned Economic Development:** Planned economic growth takes place, resources are properly and efficiently utilised, and fast economic development takes place because the private and public sector complement each other.
- **Social Welfare and Fewer Economic Inequalities:** The government's restricted control over economic activities helps in achieving social welfare and economic equality.

Disadvantages of Mixed Economy

- **Ineffectiveness and Inefficiency:** A mixed economy might not actually have the usual advantages of either the public sector or the private sector. The public sector might be inefficient due to lack of incentive and responsibility, and the private sector might be made ineffective by government regulation and control.
- **Instability:** Over time, a mixed economy might change to one of the other types of economies. It would become a command economy if the public sector expanded to such an extent that it took over the private sector. On the other hand, a mixed economy could turn into a capitalistic system if the public sector failed to produce desired results and economic institutions and decision-making passed into private hands.

- **Economic Fluctuations:** If the private sector is not properly controlled by the government, economic fluctuations and unemployment can occur.
- **Corruption and Black Markets:** Usually, if government policies, rules and directives are not effectively implemented, corruption and black markets appear.

To Sum Up: Although, in concept a mixed economy is ideal because it incorporates t advantages of both capitalism and socialis its success depends totally on governme efficiency and effectiveness. The syste has been successfully adopted by so countries, including Sweden, Denmark a Switzerland, but it has not given appropria results in many other countries.

Note:

The capitalist (market) and socialist (command) economies are two extremes. In actuality, no contemporary society falls completely into either of these polar categories. Rather, all societies today are mixed economies, with elements of both capitalism and socialism.

Activity 1.4

1 In the Ethiopian context, which one is more favorable to development – command economy, mixed economy, or capitalist economy? Explain and justify your answers.
2 What are the central questions of an economics?
3 Identify the differences between labour-intensive techniques and capital-intensive techniques

1.5 DECISION MAKING UNITS AND CIRCULAR FLOWS OF ECONOMIC ACTIVITIES

At the end of this section, you will be able to:

- construct circular flows of economic activities and interpret them.

Key Terms and Concepts

- Household
- Business firms
- Decentralization of economic power
- Economic booms and depression

Startup Activity

Discuss decentralization of economic powers, using the government FDRE's policy as a case study.

Production, exchange and consumption are three important activities of an economy. As people carry out these economic activities, transactions between different sectors of the economy occur. Because of these transactions, income and expenditure move in a circular way in an economy. This is called circular flow of income or circular diagram. Before we illustrate and explain the circular flow of income in an economy, let's consider the different sectors into which an economy is divided for this purpose. These sectors are also sometimes referred to as decision-making units of the economy. Generally they are referred to as economic agents.

The Decision-Making Units of an Economy

Household Sector

Households are the main owners of factors of production – land, labour, capital and entrepreneurship. They sell the services of these factors (called factor service) to producers and, in return, receive their income in the form of rent, wages, interest, etc. They spend a large part of their income purchasing goods and services from the producers. However, they save part of their income, and also they pay taxes to the government out of their income.

Business Sector (Firms)

In economics, we use the terms business sector, producers and firms interchangeably. Firms hire services of factors of production from households to produce commodities that they sell to households, to other firms, to the government or to other countries. Firms are the principal buyers of factors of production and they are the main producers of commodities. The business sector consists of both private and government enterprises.

Government Sector

In economics, government is taken in the sense of 'general government' so as to exclude government enterprises. General government gets its income largely from taxes imposed on households and on the business sector in the form of direct and indirect taxes. General government buys goods and services from the producers and factor services from the households. It uses these commodities and factor services to provide free services, such as police, education, medical facilities, sanitation facilities, judicial services, etc., to the people so as to satisfy their collective wants for those services.

The Rest of the World

Different sectors of an economy have transactions not only with each other, but also with foreign countries the rest of the world A country exports goods and services to other countries and similarly it imports goods and services from other countries.

Note:

For the sake of simplicity, we shall limit our future discussion in this section to a closed economy, which is an economy that does not interact with the rest of the world and therefore is not engaged in the import or export of goods and services.

Activity 1.5

Perform these tasks:

1 Identify the decision-making units of an economy.
2 Discuss the objectives of each decision-making unit.

Definition:

A circular flow of income is a visual model of an economy that shows how a currency, such as the Birr, flows through markets among decision-making units.

Circular Flows of Income and Expenditure

A circular flow is a pictorial representation of the continuous flow of payments and receipts for goods and services and factor services between different sectors of the economy.

Flow Types

Economic transactions, like the sale and purchase of goods and factor services, generate two kind of flows real flows and money flows see Figure 1.6.

Note that real flows and money flows are two sides of the same coin. A real flow of goods and services is matched by an equal but reverse money flow.

Real Flows

Real flows consist of the flows of

- factor services from the owners of factor services to the producers and
- goods and services from the producers to the buyers.

Money (Financial) Flows

Money flows consist of the flows of

- money incomes from factor services such as rent, wages, interest, etc., and
- the money expenditures incurred for the purchase of goods and services.

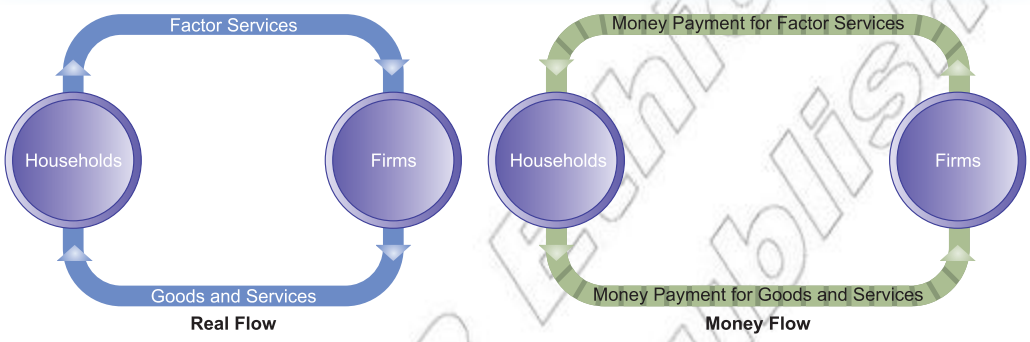


Figure 1.4: Circular Income Flows – Real Flow and Money Flow

Models of Circular Flow

For closed economies, we have two models of circular flow:

- Two-sector model, consisting of the flows between households and the business sector (firms).
- Three-sector model, consisting of the flows among households, the business sector, and the government sector.

Two-Sector Models of Circular Flow

The two-sector model represents a private closed economy with only two sectors – the household sector and the business sector (firms). It can further be divided into these two types:

i Two-sector economy without savings

ii Two-sector economy with savings

I Two-Sector Economy without Savings

In this model our assumptions are:

- There are only two sectors in the economy: the household sector and business firms.
- Household sectors are owners of factors of production and they supply factor services to the firms.
- Firms produce goods and services and sell their entire output to households.

- Households receive income for their factor services and spend the entire amount on consumption.
- There is no savings in the economy.
- There is no government sector.
- It is a closed economy, and therefore there are no exports or imports.

The circular flows in a two-sector economy without savings are illustrated in Figure 1.5.

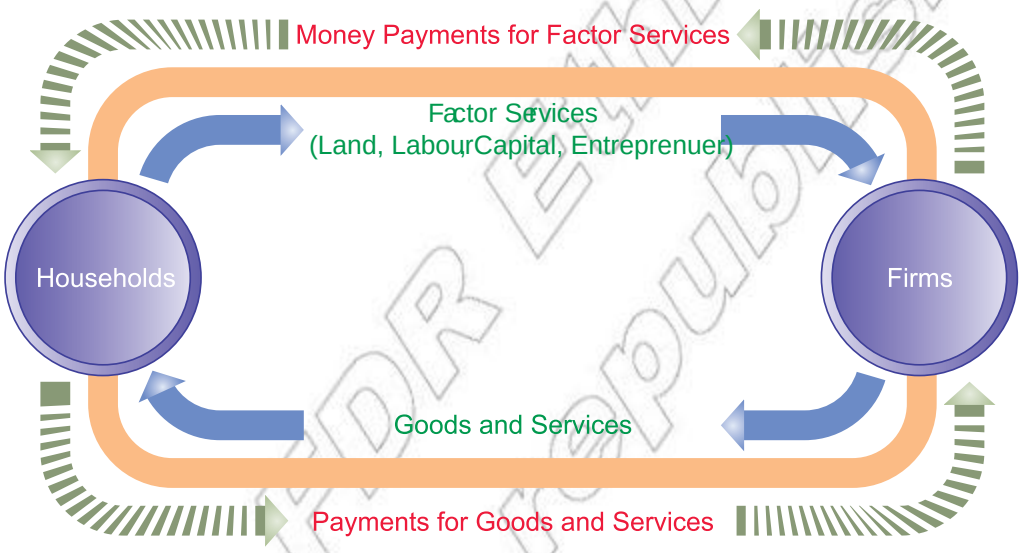


Figure 1.5: Circular flow of income in a two-sector economy without savings

Note that Figure 1.5 shows the two types of flows – real flow (of factor services and of goods and services) and money flow.

There is a continuous flow of factor services (in the form of land, labour, capital and entrepreneurship) from households to firms in the economy. Firms produce goods and services with the help of these factors and supply them to the households for consumption. This is called real flow of goods and services. The inner circle of the diagram shows the real flow.

Since, in a monetary economy, all payments are made in money, the real flow is also the money flow of income, which is shown as the outer circle of Figure 1.5. When firms get factor services from households, they make monetary payments against them to the households. Households spend this income on the purchase of goods and services from the firms for their consumption. Because, in this model, the households spend all their income on consumption of goods and services, the

total money receipts of the firms is the same as the total income of the households. Thus, money flows from firms to households (as payments for factor services) and back from households to firms (as payments for goods and services). This is the money flow of income shown by the outer circle of the diagram in Figure 1.5.

II Two-Sector Economy with Savings

In the real world not all income is spent on consumption. Part of it is saved. For the sake of simplicity, we assume that savings are made by the household sector only. These savings are deposited in the capital market or in the financial system (such as banks, insurance companies, financial institutions, etc.). From the capital market, these savings flow to the firms for investment. The circular flow of income in a two-sector economy with savings is illustrated in Figure 1.6.

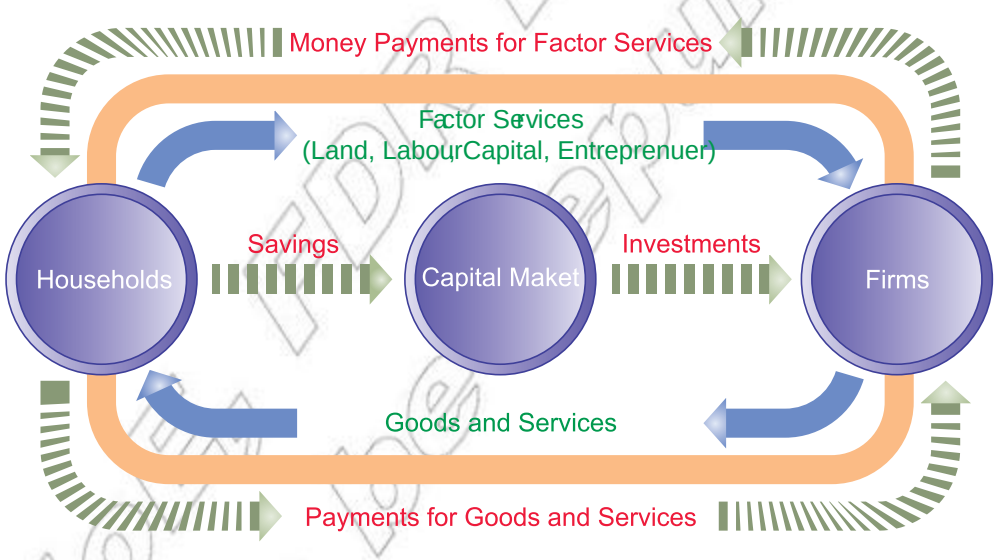


Figure 1.6: Circular flow of income in a two-sector economy with savings

Three-Sector Model of Circular Flow

In the three-sector model of circular flow, the economy has the following three sectors: households, firms, and government. In this model, activities of the government (as well as of the other two sectors) influence the flow of income. There are two main categories of economic government activities: government revenue and government expenditure.

The circular flow of income in a three-sector economy is shown in Figure 1.7.

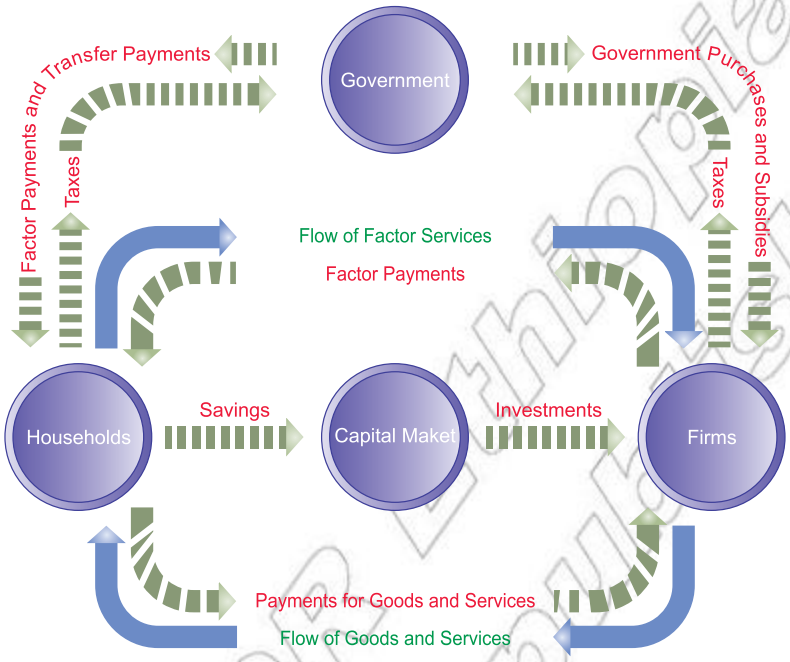


Figure 1.7: Circular flow of income in a three-sector economy

The figure shows that firms make payments to households against factor services received from them. And households make payments to firms for goods and services purchased from them. Household savings are deposited in the capital market and, in turn, they are given to the firms for investment.

Government gets its revenue by imposing taxes on households and on firms. Government pays back this revenue to the firms and households by purchasing goods and services from them. Also, government gives subsidies to the firms and transfer payments to the households. In this way, national income flows in a circular form among the three sectors of the economy.

Entrepreneurs

An entrepreneur is a person who organises the other factors (resources) and undertakes the risks and uncertainties involved in production. He or she hires the other three factors, brings them together, and organises and coordinates them in a way that results in the earning of maximum profit. For example, Mr. X, who takes the risk of manufacturing television sets, is an entrepreneur.

An entrepreneur acts as the leader and decides how the business shall run. He or she decides in what proportion factors should be combined. The entrepreneur is

© MoE FDR Ethiopia Not to be republished

loosely identified as the owner, speculator, innovator or inventor, and organiser of the business. Entrepreneurship is practiced by the entrepreneur is a production resource that coordinates labor, capital, natural resources and technology.

Characteristics of Entrepreneurs

An entrepreneur must possess these characteristics, and must exercise them with both mind and heart, to create and run a successful business:

- Far sightedness: The entrepreneur must be far-sighted. He should possess the ability to foresee changes in the market place.
- Courage: The entrepreneur must be courageous in order to meet the challenges and difficulties of business.
- Quality of leadership: An entrepreneur must be a leader and able to influence people and win their confidence. He or she must also be thoughtful and skilled.
- Ability to organise labour: An entrepreneur must be a good organiser. He or she must be sympathetic, flexible and helpful in order to recognise and solve genuine problems of the business's labour force.
- Experience: The entrepreneur must be experienced and skilled. Experience can make even a person of average intelligence an effective entrepreneur.
- Knowledge of business: The entrepreneur must be familiar with business activities and master of his or his trade.
- Moral quality: The entrepreneur must have good morals and confidence in them.
- Knowledge of psychology: The entrepreneur must be a good administrator and understand the psychology of the workers.
- Decision-Making Ability: Proper analysis of risks and prudent decision-making is another essential requirement for being a good entrepreneur.

Roles of the Entrepreneur in Economic Development

- Performs the Role of an Administrator: A primary factor in modern economic development is the emergence of dynamic, intelligent, enterprising entrepreneurs. An entrepreneur shoulders the responsibility for the entire business, starting with the planning stage and continuing through expanding it from its foundation to full development.

- Performs the Role of a Coordinator: In co-ordinating and guiding different factors of production, the entrepreneur makes use of land for building construction and invests his or her money capital in the buildings, machinery, equipment, tools and raw materials. Simultaneously, the entrepreneur organizes the workers and directs them in performing the required tasks.
- Proper Utilisation of Labour Force: Utilizing skilled, semi-skilled and unskilled workers in appropriate proportions is another important enterpreneurial function, as is the correct and equitable allocation of duties.
- Distributes Appropriate Remuneration to Each Factor of Production: The entrepreneur distributes proper remuneration to each factor of production.
- Plays the Crucial Role of an Innovator: The entrepreneur is an innovator. An entrepreneur discovers and develops new ideas, techniques, products, markets, sources of supply of raw materials, opportunities, and methods of production and also develops new combinations of factors.
- Other (particularly relevant to under-developed and developing countries).
  - Generates new employment.
  - Helps ensure balanced regional development.
  - Provides economic leadership.
  - Complements and supplements economic growth.
  - Helps to bring about social stability.

The last qualities on the preceding list of desirable entrepreneurial characteristics are particularly relevant to entrepreneurs operating in under-developed and developing countries.

Activity 1.6

With your workgroup, perform these tasks:

1 Draw a two-sector economy circular flow diagram and discuss the roles of each economic agent – the households and firms.

2 Define circular flow diagram.

UNIT SUMMARY

Definition of Economics

- The study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce various commodities over time and distribute them for consumption now and in the future among various people and groups of society. (Samuelson)

Nature of Economics

- Economics is not a science only or an art only. It is both a science and an art.

Main Branches of Economics – Microeconomics and Macroeconomics

- Microeconomics deals with the economic behaviour of individual economic units and individual economic variables.
- Macroeconomics deals with the functions of the economy as a whole.

Methods used to Study Relationships between Economic Variables

- Deductive and inductive reasoning
- Use of economic laws
- Building economic models
- Application of statistical methods (econometrics)
- Avoidance of or use of value judgments (positive and normative economics)

Nature of Economic Laws

- Are very close to being statements of tendencies :
  - they are conditional and associated with qualifications and assumptions,
  - they establish relationships between causes and effects,
  - they are less exact and less definite than the laws of physical sciences,
  - they are not permanent and general.

Basic Economic Concepts

- Economy – An economy is a system that provides people with the means to work and earn a living.
- Economic problem – The economic problem is how to use scarce resources among alternative human wants and how to use these resources towards the end of satisfying the peoples' wants as fully as possible.
- Scarcity – Limitation of supply of a commodity in relation to the need for it.
- Choice – The economic problem is a problem of choice. Every economy must make choices between various types of goods that can be produced with given limited resources.
- Opportunity cost – The opportunity cost of any good is the amount of the next-best alternative good that is given up to produce the first good.

$$\text{Opportunity cost of a commodity} = \frac{\text{the amount of the next-best alternative given up}}{\text{the amount of the commodity produced}}$$

- Efficiency – Optimum utilisation of existing resources or making the best use of available resources.
- Free resources – Resources that are free gifts of nature, are unlimited in supply, and do not have a price.
- Economic resources – Resources that are scarce and have a price.
  - Land – All natural wealth that is on and under the surface, such as rivers, soil, forests, mines, etc.
  - Labour – All mental and physical labour that is helpful in the production of goods and services.
  - Capital – All man-made goods that are used for further production of wealth, such as machines, tools, buildings, etc.
  - Enterpreneur – A person who organises the other factors (resources) of production and undertakes the risks and uncertainties involved in production.

Roles of an Entrepreneur in Economic Development

- Administrates
- Coordinates
- Innovates
- Properly uses his or her labour force.
- Distributes duties and remuneration appropriately.

- Other (particularly relevant to under-developed and developing countries)
  - Generates new employment.
  - Helps ensure balanced regional development.
  - Provides economic leadership.
  - Complements and supplements economic growth.
  - Helps to bring about social stability.
- Central problems of an economy
  - What to produce?
  - How to produce?
  - For whom to produce?
- Labour-intensive technique – a labour-intensive technique uses more labour, relative to capital, per unit of output.
- Capital-intensive technique – a capital-intensive technique uses more capital, relative to labour, per unit of output.
- Economic growth – an increase over time in per-capita output of material goods.
- Production Possibility Curve (PPC) – a curve that depicts all possible combinations of the maximum output that can be produced in an economy with given resources and technology (also called the production possibility frontier).
- Shape of the PPC – a downward sloping curve, concave to the origin.
- Economic system – a legal and institutional framework within which various economic activities take place.
- Capitalistic economy – a system of economic organisation featured by the private ownership and the use for private profit of man-made and nature-made capital.
- Command economy – a system in which economic organisations engaged in production and distribution are owned and controlled by the state and are put to use under a centralised plan.
- Mixed economy – an economy having the characteristics of both capitalism and socialism, that is, a combination of private and public ownership of the means of production, with some measure of control by the government.
- Major decision-making units of an economy – household sector, business sector (firms), government, and the rest of the world.
- Circular flow – a pictorial illustration of the continuous flow of payments and receipts for goods and services and for factor services between different sectors of the economy.
- Real flow – flow of resources, goods and services.
- Money flow – flow of income and expenditures.

REVIEW EXERCISE FOR UNIT 1

I Write detailed answers to the following:

1 How has economics been defined in modern times? As part of your answer, consider definitions by modern economists.

2 Describe the nature of economics. Should it be treated as a science or an art?

3 What do you understand by microeconomics and macroeconomics? Discuss the major concerns, components and analytical tools of each of them.

4 "Study and knowledge of economics is extremely useful and important". Justify the statement.

5 Describe the various kinds of methods usually adopted to study the relationships between economic variables.

6 Describe the main features of economic laws.

7 What do you understand by positive economics and normative economics?

8 Describe the four categories of economic resources.

9 Discuss the concept of opportunity cost and explain how opportunity cost can be calculated.

10 What qualities does a successful entrepreneur possess?

11 Describe the role of an entrepreneur in the economic development of a country.

12 What are the central problems of an economy? Discuss them in detail.

13 What is a production possibility curve? How is it used to explain the central problems of an economy?

14 Explain the concept of opportunity cost. As an important part of your explanation, include a production possibility curve.

15 Describe why the shape of a production possibility curve is downward sloping and concave to the origin.

16 What do you understand by the term economic system? How can economic systems be classified on the basis of ownership of resources?

17 What is capitalism? Describe its main features. What are the merits and problems of capitalistic economy?

18 Discuss the basic characteristics of a command economy and mention its major advantages and disadvantages.

19 Explain the concept of mixed economy giving its main features.

20 Explain how a mixed economic system combines the advantages of the capitalist and command economies.

21 Describe the main features of the various decision-making units of an economy.

22 Explain circular flows of income. As part of your explanation, include references to real flows and money flows.

23 Explain circular flows of income in the two kinds of two-sector economies:

- circular flow with savings
- circular flow without savings

As an important part of your explanation, include a diagram for each of the flows.

24 Explain circular flows of income in a three-sector economy. As an important part of your explanation, include a diagram of the flow.

II Distinguish between the following:

25 Microeconomics and macroeconomics

26 Deductive method and inductive method

27 Positive economics and normative economics

28 Free resources and economic resources

29 Labour-intensive production technique and capital-intensive production technique

30 Capitalistic economy and command economy

31 Real flows and money flows

III Label each of the following as 'True' or 'False':

32 The early name of economics was political economy.

33 Macroeconomics deals with the behaviour of individual economic units.

34 Microeconomics is also known as theory of income and employment.

35 The deductive method involves a movement from general to particular.

36 Normative economics involves value judgments.

37 Economic laws are not permanent and general.

38 Land is an example of a free resource.

39 By labour, we mean only the physical labour involved in the production of goods and services.

40 Economic growth can be achieved through technological advancement.

41 A command economy allows economic freedom for consumers and producers.

IV In each of the following, four choices are given, but only one out of them is correct. Choose the correct one.

42 Which of the following is not a feature of a capitalistic economy?

A right to private property
B maximum social welfare
C freedom of enterprise
D inequality of income

43 Which of the following is not a feature of a command economy?

A right to private property
B collective ownership
C central economic planning
D maximum social welfare

44 A closed economy does not allow:

A sale of goods to households
B sale of goods to government
C sale of goods to other countries
D sale of goods among different business firms of the country

45 Any point lying on a production possibility curve indicates:

A inefficient utilisation of resources
B full utilisation of resources
C unattainable combination of goods to be produced
D none of these

46 A production possibility curve is:

A a horizontal straight line
B a vertical straight line
C an upward sloping curve
D a downward sloping curve

V Write very short answers to the following:

47 Who is popularly known as the father of economics?

48 Is economics an art or a science?

49 Give two examples of free resources.

50 Give two examples of economic resources.

51 Which economic system provides the right to private property?

52 Which economic system leads to maximum social welfare?

53 Name the economic system that combines the advantages of capitalism and socialism.

54 Mention two major causes of economic problems.

55 What are the three basic problems (or equations) of an economy?

56 What are the two main types of production technique?

57 How can economic growth be achieved?

58 What is another name for Production Possibility Curve?

59 What does a point lying inside a PPC indicate?

60 What does the rightward shift in a PPC indicate?

61 Who solves the central problems in a command economy?

62 Can there be an economy without economic problems?

63 Using a PPC, illustrate the growth of resources in an economy.

64 Give two main characteristics of economic resources.

65 If an economy's technology improves, in what direction does the PPC shift?

66 What are the main tools of analysis in macroeconomics?

67 What are the main tools of analysis in microeconomics?

68 What is a closed economy?

69 What other name is given to money flows?

70 Mention two qualities which an entrepreneur must possess.

71 Mention two ways in which an entrepreneur contributes to economic development.

VI With your economics workgroup, perform these tasks:

72 Table 1.3 shows a production possibilities schedule for war goods and civilian goods:

Table 1.3 Hypothetical production possibility schedule for war goods and civilian goods

Type of Product	Production possibilities				
	A	B	C	D	E
Automobiles (in '000s)	0	2	4	6	8
Rifles (in'000,000s)	30	27	21	12	0

a Show these production possibilities through a production possibility curve. What do the points on the curve indicate?

b Label a new point, G, inside the curve. What does this point indicate?

c Label a new point, H, outside the curve. What does this point indicate?

d What must occur before the economy can attain the level of production indicated by point H?

73 Calculate the opportunity cost per unit of shirts in terms of pens at different production possibilities from the data in Table 1.4.

Table 1.4 Hypothetical production possibility schedule for shirts and pens

Production possibility	Shirts (units)	Pens (units)
A	0	20
B	1	18
C	2	14
D	3	8
E	4	0

74 The production possibilities of an economy are given in the Table 1.5. Plot the PPC and show that it is concave to the origin. Explain the reason for the concave shape of PPCs.

Table 1.5 Hypothetical production possibility schedule for good X and good Y

Production possibilities	A	B	C	D	E	F
Good X (units)	0	1	2	3	4	5
Good Y (units)	30	28	24	18	10	0

75 An economy produces two goods, T-shirts and mobile phones. Table 1.6 summarises its production possibilities. Calculate the opportunity costs of T-shirts of the various combinations.

Table 1.6 Hypothetical production possibility schedule for T-shirts and mobile phones

T-shirts (in million)	Mobile phones (in thousands)
0	90
1	80
2	68
3	52
4	34
5	10

76 Calculate the opportunity cost, per unit of sugar in terms of cloth, at the different production possibilities shown by from the hypothetical data on a country shown in Table 1.7.

Table 1.7 Hypothetical production possibility schedule for cloth and sugar

Production possibilities	Cloth (million metres)	Sugar (million kg)
A	0	50
B	1	45
C	2	38
D	3	30
E	4	20
F	5	6

VII Suggested Individual/Group Activities

77 Using sources such as books, dictionaries of economics, encyclopedias, internet reference sites, etc., prepare a compilation of definitions of economics given by economists from different countries. Identify how the emphasis has changed over the years from wealth to welfare, scarcity, income, employment, economic growth, environmental accounting, etc. Group the definitions according to their focus of concern.

78 Using available resources, make a list of different branches of economics and describe the scope of each.

79 Read the following two famous books on economics:

- The Nature and Causes of Wealth of Nations by Adam Smith
- General Theory of Employment, Interest and Money by J. M. Keynes

Prepare a report on the ideas of the authors about the meaning and scope of economics and its theories and principles.

80 Prepare a list of 10 resources that are free gifts of nature, but that are limited in supply and have a price.

81 Make a list of some leading entrepreneurs from your locality, region state, etc.

82 You have studied different economic systems classified according to the ownership of resources – capitalistic economy, command economy, and mixed economy. Economic systems can also be classified on the basis of level of economic growth – developed economy, under-developed economy and developing economy. Prepare a brief report on the nature and characteristic features of these levels of economies after reading relevant literature in the form of books, dictionaries, etc., from your school library.

83 Identify and list the economic systems adopted by different Ethiopian governments since the 1960s.

84 Is the Ethiopian economy a closed economy? If no, prepare a list of major items imported and exported by Ethiopia.

85 You have studied the two-sector and three-sector models of circular flows in the context of a closed economy. But, as we know, economies all over the world today are open economies, in which foreign trade plays an important role.

Add the rest of the world sector to the three-sector model, and create a four-sector model of circular flows on chart paper. Your teacher will help you to display it in your classroom.

á

2

Unit Objectives

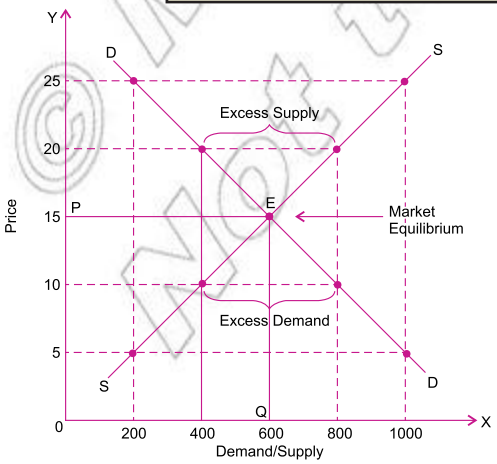
After completing this unit, you will be able to:

- understand, analyze and interpret the demand and supply concepts with schedules, graphs and equations;
- Recognize the factors affecting demand and supply, and then appreciate the law governing them;
- understand equilibrium price and quantity; and
- understand the essence of different elasticities of demand and supply.

Main Contents

2.1 THEORY OF DEMAND
2.2 THEORY OF SUPPLY
2.3 MARKET EQUILIBRIUM
2.4 ELASTICITY OF DEMAND AND SUPPLY
2.5 ELASTICITY OF SUPPLY

- Unit Summary
- Review Exercise



INTRODUCTION

Having learnt about the concept and meaning of economic as a subject and its nature, scope, different systems and various other fundamentals in the previous unit, we carry forward our exploration and understanding of the vast field of economics by focusing on two very powerful tools, namely, theory of demand and theory of supply, in the present unit. One knowledge about the basic elements of demand and supply will help us in a better analyses and explanation of the various changes in the economic environment around us, particularly, the working of a market economy.

In this unit we begin with the study of the concepts, laws, determinants and other aspects of demand and supply; examine the effects of changes in the market equilibrium; and finally learn about the concepts of elasticity of demand and supply, which basically represent a quantitative relationship between changes in demand/supply and changes in price of a commodity.

2.1 THEORY OF DEMAND

At the end of this section, you will be able to:

- define concept of demand;
- examine the law of demand;
- construct and interpret the demand schedule, graph and function; and
- describe the basic determinants of demand.

Key Terms and Concepts

- Demand
- Demand schedule
- Demand curve
- Price demand
- Income demand
- Cross demand
- Joint demand
- Composite demand
- Direct demand

Start up Activity

When price of a commodity increases, some individuals stop buying it, some reduce the amount they used to buy, others continue buying the same amount. Why individuals respond differently? Do you think there are commodities, which we continue consuming the same amount even if its price increasing?

Demand

The words demand, desire and want are often interchangeably used to express what an individual needs and what he would like to acquire. However, in economics, the term demand has a specific meaning. It refers to the amount of commodity which an individual buyer is willing and able to buy at a given price and during a given period of time. As such demand is different from a mere desire. Human wants are unlimited, and therefore, desires are many. But only a desire that is backed up by the capacity to pay the price for the commodity and the willingness to buy it, is termed as a demand. We may say demand refers to an effective desire. A desire becomes an effective desire or demand only when it is backed by the following three factors:

- ability to pay for the good desired,
- willingness to pay the price of the good desired, and
- availability of the good itself.

Moreover, demand for a good is always expressed in relation to a particular price and particular time, for example, you may be interested in buying a particular shirt at a price of Birr 200, but you would not demand it at all if it is priced at Birr 700. Similarly, an individual may be willing to buy a room heater at a price of Birr 1000 during a cold, but he/she may not be interested in buying it at this price during a hot season.

From the above discussion, we may define demand as follows:

> Demand for a commodity is the amount of it that a consumer is willing to buy at various given prices and a given moment of time.

Note:

- A commodity refers to any good produced for sale in the market.
- Demand and quantity demanded are two different concepts. Whereas demand refers to the relationship between the price of a commodity and its quantity demanded, other things being same the quantity demanded refers to a specific quantity which a consumer is willing to buy at a specific price.

© MoE, FDRE Ethiopia Not to be republished

Demand Schedule

A demand schedule is a tabular statement that states the different quantities of a commodity that would be demanded at different prices. Demand schedules are of two types:

i Individual demand schedule.

ii Market demand schedule.

i Individual demand schedule is a tabular statement which shows the quantity of a commodity demanded by an individual household at various alternate prices per time period

Table 2.1: Individual Demand Schedule

Price (Per kg)	Quantity Demanded
10	4
15	3
22	1

The above demand schedule shows the different quantities of mangoes demanded by an individual at different prices. At Birr 10 per kg consumer demands 4 kg mangoes but at Birr 22 per kg consumer demands 1 kg mangoes.

ii Market demand schedule is a tabular statement which shows the different quantities of a commodity demanded by different households or consumers in a market at various alternate prices per time period.

Table 2.2: Market Demand Schedule

Price (Per kg)	X`s Demand	Y`s Demand	Market Demand (X+Y)
10	4	6	10
15	3	4	7
22	1	2	3

The above demand schedule shows the different quantities of mangoes demanded by different consumers at different prices. At Birr 10 per kg X demands 4 kg whereas Y demands 6 kg, so market demand at Birr 10 per kg is 10 kg. But at Birr 22 perkg X demands 1 kg whereas Y demands 2 kg, so market demand at Birr 22 per kg is 3 kg.

© FDRE Ethiopia Not to be republished

Demand Curve

A demand curve conveys the same information as a demand schedule. But it shows the information graphically rather than in a tabular form. Demand curves also are of two types

i Individual demand curve

ii Market demand curve

i Individual demand curve refers to the curve which expresses graphically the relationship between different quantities of a commodity demanded by an individual at different prices per time period.

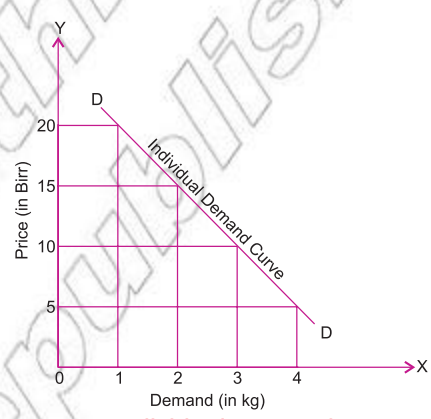


Figure 2.1: Individual Demand curve

The above demand curve shown in Figure 2.1 shows the different quantities of a commodity demanded by an individual at different prices.

ii Market demand curve refers to the curve which express graphically the relationship between different quantities of a commodity demanded by different households or consumers at different prices per time period. It shows the demand of a whole market for a commodity.

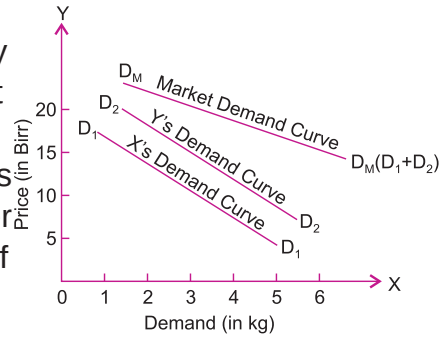


Figure 2.2: Individual and market demand curves

The above market demand curve shows the horizontal summation of individual demand curves. It expresses the relationship between different quantities of a commodity demanded by X and Y at different prices. Market demand is obtained by horizontally summing individual demands at each price.

© MOE-EDRI Ethiopia Not to be republished

Demand Function

All the above factors influencing the demand for a commodity can be briefly expressed in the following functional relationship:

$$D_x = f(P_x, P_y, P_z, Y, T) \quad (2.1)$$

Where, D_x stands for the demand for a commodity X,

P_x shows the price of commodity X,

While P_y and P_z refer to the prices of other substitutes and complementary goods. Y represents the income level of the consumers, while T is an indicator of their tastes and preferences. The word f shows the functional relationship between the demand for x and the other variables, P_x, P_y, P_z, Y, T etc. In simple words, this functional relationship shows that the demand for commodity X depends upon the price of X, the prices of other goods, Y and Z, the income of the consumers and their tastes and preferences.

Law of Demand

Law of demand expresses the functional relationship between the price of a commodity and its quantity demanded. Price and demand are observed to be inversely related. In other words, all other factors remaining constant, more of a commodity is demanded when price falls and less of it is demanded when price rises, provided other factors remain the same. For example, if the price of apples rises, people will buy less of them and vice-versa.

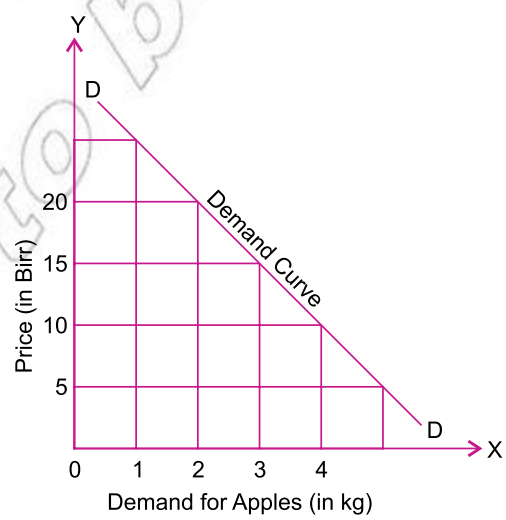


Figure 2.3: Demand curve

© MoE-EIDR Ethiopia Not to be republished

In Figure 2.3, we observe that when the price of apples is Birr 20 per kg, the demand is 2 kg. But when the price of apples falls to Birr 10 per kg, the demand for apples rises to 4 kg.

Statement of the Law:

The law of demand states that, other things being equal, at a higher price consumers will purchase less of a commodity, and at a lower price, consumers will purchase more of it.

Or

A rise in the price of goods leads to a fall in quantity demanded and vice-versa, assuming all other determinants of demand are kept constant.

Assumptions of the Law of Demand

Law of demand depends on the basic assumption of other things being equal (ceteris paribus). By other things we mean factors other than price which affect the demand for a commodity. For example, prices of related goods, tastes and preferences of consumer, income of the consumer, population, etc. For the law to operate correctly, there should be no change in any of these determinants.

We may summarize the assumptions of the law of demand as follows:

- There should be no change in prices of related goods,
- Tastes and preferences of the consumer should remain constant,
- There should be no change in the income of the consumers,
- The size of the population should remain constant,
- Distribution of income and wealth should be equal,
- There should be perfect competition in the market.

Exceptions to the Law of Demand

There are some situations when the law of demand does not operate. With an increase in price, more quantity of a commodity is purchased and vice-versa. In these situations demand curve is upward sloping. These are known as exceptions to the law of demand. Main exceptions are as follows:

- Giffen Goods: is a good for which an increase in the price raises the quantit demanded. Economists use the term Gif good to discribe a good that violates the la of demand. (The term is named for economist Robert Giffen, who first noted this possibility) Giffen goods are very rare.

> **Note:**
>
> Giffen goods are a special category of inferior goods.

- Prestige Goods: Some consumers measure the utility of a commodity entirely by its price. For example diamond is considered as a prestige good in the society, the higher the price of diamonds, the higher the prestige value of them. When the price of diamonds goes up their prestige value will go up and , as a result, quantity demanded by consumers will rise.
- Expectation of People about the Future: This assumption relates to the changes in the expectations of the people regarding prices of the commodities in the future. For example, if rainfall in any year does not occur in adequate quantity and there is widespread drought, the expectations of the people will be that the prices would rise in the future. Therefore, even if the prices of food grains are higher at present, they would demand greater quantities since they will be expecting even higher prices in future.
- Necessities: There are some commodities which are necessities of life – for example, food grains, salt, medicines, etc. A minimum quantity of these commodities has to be purchased by the consumer irrespective of their price. The law of demand does not hold good in case of these commodities.

Basis of the Law of Demand Or Why Does the Demand Curve Slope Downwards?

Demand curve normally slopes downwards to the right. It is also known as the negative slope of the demand curve, indicating an inverse relationship between the price of the commodity and its demand. There are several reasons for this inverse relationship as given below:

- Law of diminishing marginal utility: According to this law, if a consumer increases the consumption of a commodity in a given time period, the utility from consumption of each successive unit goes on diminishing. Due to this reason, the consumer will purchase the additional unit of commodity only when he can pay less for it. Therefore, with a fall in price more units of a commodity will be demanded and with a rise in price, fewer units of a commodity will be demanded.

- **Income effect:** When the price of a commodity falls, a consumer can buy more of the commodity with the same amount, indicating an increase in his real income. Similarly, a rise in the price leads to a fall in real income of the consumer, and hence he buys less of a commodity. This is called income effect.
- **Substitution effect:** When the price of a commodity falls, it becomes relatively cheaper than its substitutes. So people who are consuming the other goods would now start consuming the commodity whose price has fallen, and as a result, its demand increases. This increase in demand is called the substitution effect of price change.
- **Change in the number of consumers:** A fall in the price of a commodity increases the number of households who demand it in the market and a rise in the price of commodity reduces this number.
- **Different uses of a commodity:** At a lower price, a commodity will be in high demand for being put to different uses. Conversely, at a higher price, its use will be limited to a few essential uses only and hence the total demand will go down. For example, electricity could be used for various purposes like lighting lamps, heating rooms and operating TV, refrigerator, air conditioners etc. Suppose the price of electricity rises from Birr 1 per unit to Birr 2 per unit. Then its consumption will be restricted to only essential purposes like the lighting of lamps and operating of fans etc. As a result, the total demand for electricity will decrease. On the other hand, a fall in the price of electricity will encourage its use for different purposes and hence, the total demand for electricity will increase.

Determinants of Demand

An individual's demand for a commodity is determined by a number of factors. Some of these important factors are as follows:

- **Price of the Commodity:** The price of a commodity is the most important factor which affects the demand for a commodity. Other things remaining the same, if price increases, quantity demanded decreases, and if price decreases, quantity demanded increases.
- **Income of the Consumer:** Income of the consumer is also an important factor affecting the demand for a commodity. Generally when income increases, demand also increases, and when income decreases demand also decreases. This is true in the

Note:

The concepts of normal goods/inferior goods are explained in detail in coming sections.

case of normal goods. However, in the case of inferior goods, with an increase in income their demand decreases and vice-versa.

- **Prices of Related Goods:** Changes in the prices of related goods also affect the demand for a commodity. Related goods may be of two types:
  - Substitute goods, and
  - Complementary goods.
  - **Substitute Goods:** Substitute goods are those goods which can be used in place of each other to satisfy a given want. That is why they are also called competitive goods. Coffee and tea, pens and pencils, butter and oil, etc., are examples of substitute goods.
  - **Complementary Goods:** Complementary goods are those goods which are used together to satisfy a given want. If two goods are complementary goods, a decline in the price of one would directly change the demand for other commodity and vice-versa. For example, cars and petrol are complements of each other. If the price of car increases, its demand will decrease and thus will lead to a decrease in the demand for petrol and vice-versa.
- **Tastes and Preferences:** The amount demanded of a commodity also depends on consumer tastes and preferences. If a consumer is accustomed to certain commodities, he will demand that commodity and this leads to increase in the demand for that commodity.
- **Future Expectation of Changes in the Price:** If there is an expectation of increase in the price of a commodity in the near future, consumers will start demanding more of it. Contrary to that, if the price of that commodity is likely to fall in near future, consumers will start demanding less of that commodity.
- **Climate:** The demand for a commodity is also affected by climate. For example, demand for woolen clothes increases in cold seasons. On the other hand demand for coolers, cotton clothes etc., increases in hot seasons.
- **Population and Number of Households:** Changes in population or number of households also affect the demand for goods. For example, with the increase in number of households the demand for consumer goods will also increase.
- **Distribution of Income and Wealth:** If the distribution of income and wealth in a society is unequal, the demand for such commodities will be more which are generally demanded by the rich people. On the other hand, if there is equal distribution of income and wealth in the society, the demand for such commodity will be less which are specially used or demanded by the rich people.

Demand mainly depends upon three factors, namely

- Price of the commodity;
- Price of related goods.
- Income of the consumer, and

On the basis of the above three factors, demand can be classified into three types:

i Price Demand,

ii Income Demand, and

iii Cross Demand.

i **Price Demand:** Price demand indicates, other things being equal, the relationship between the price of a commodity and its quantity demanded.

$$D_x = f(P_x) \qquad (2.2)$$

Where, D_x = Demand for commodity X, P_x = Price of commodity X.

There is inverse relationship between price of a commodity and its demand. In other words, when price of a commodity falls, its demand rises, and when price of a commodity rises, its demand fails.

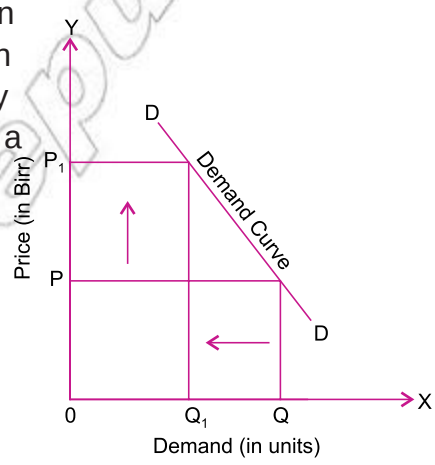


Figure 2.4: Demand curve

The above demand curve clearly indicates the inverse relationship between price of a commodity and its demand. When price is OP, demand is OQ. When price rises to OP_1 demands falls to OQ_1. The fall in demand (QQ_1) is due to rise in price (PP_1).

ii **Income Demand:** Income demand indicates, other things being equal, the relationship between the income of consumer and demand for a commodity.

$$D_x = f(Y_d) \qquad (2.3)$$

Where, D_x = Demand for commodity X, Y_d = disposable income of consumer.

Generally, the demand for a commodity changes in the same direction as change in income, with a higher level of income leading to a larger demand, and with

© MoE, FDRE Ethiopia Not to be republished

a smaller income resulting in a fall in demand. However, an increase in income does not always and invariably lead to an increase in the demand for all the commodities. Thus, it is the nature of the commodity on which its demand depends. On the basis of nature, goods can be classified into two types:

- Normal Goods (Superior Goods),
- Inferior Goods.

a Normal goods refer to those goods whose income effect is positive – i.e., all other factors remaining the same, as income increases, demand also increases and vice-versa. For example, cheese, butter, chocolates, biscuits, etc.

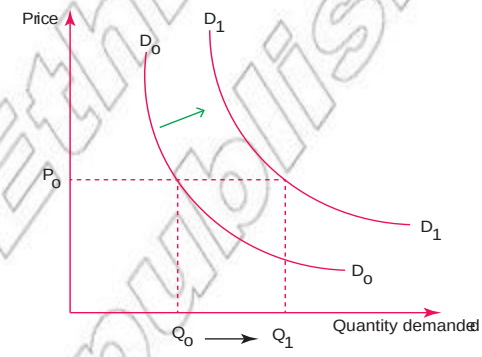


Figure 2.5: Income expanding path for normal goods

The above demand curve show change in demand due to increase in income, keeping other factors unchanged, for normal good. When income of a consumer increases, his/her demand curve shifts to the right from D_0 to D_1 for normal goods.

b Inferior goods refer to those goods whose income effect is negative – i.e., all other factors remaining the same, as income increases, demand decreases and vice-versa. For example, some chinese shoes, coarse cloth, leftover food etc.

Not all goods are normal goods. If the demand for a good rises when income falls, the good is called an inferior good. An example of an inferior good might be bus rides. As your income falls, you are less likely to buy a car or take a cab, and more likely to ride the bus. If income increases, the demand for inferior goods decreases.

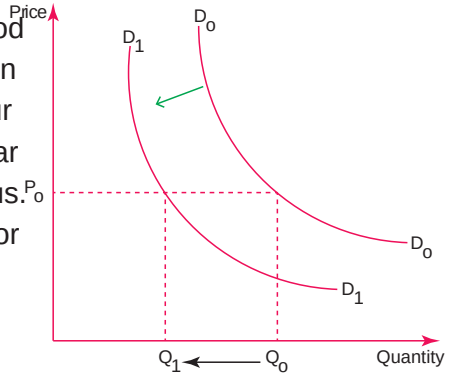


Figure 2.6: Income expanding path for inferior goods

© MoE FDR Ethiopia Not to be republished

The above graph shows the effect of increase in income on demand of inferior goods, assuming other factors unchanged. Consumption of the inferior good decreases from D_0 to D_1 due to increase in income of a consumer.

The reason for the fall in the demand for inferior goods due to increase in income is that previously the consumer was not able to afford superior goods. When the income of consumer rises, she/he shifts from inferior to superior goods. As a result, demand for inferior goods falls.

iii Cross Demand: Cross demand indicates, other things being equal, the relationship between the price of a commodity and demand for related goods (substitute goods or complementary goods).

$$D_x = f(P_y) \qquad (2.4)$$

Where, D_x = Demand for commodity X, P_y = Price of commodity Y.

Related goods are of two types:

a Substitute goods, b Complementary goods.

a Substitute goods refer to those goods which can be used in place of each other to satisfy a given want. That is why they are also called competitive goods. For example, tea-coffee, pen-pencil, butter-oil, etc., are good substitutes for each other. Substitutes are two goods which an increase in the price of one leads to an increase in the demand for the other. For example, butter and margarine are substitutes. A rise in the price of butter causes an increase in the demand for margarine.

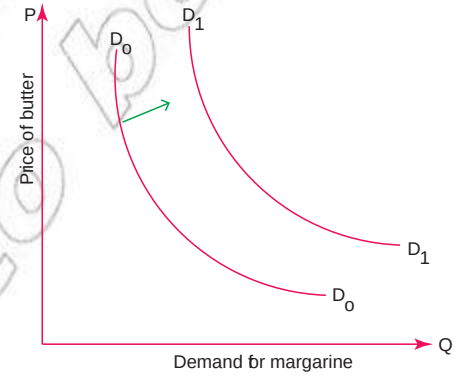


Figure 2.7: Shift in demand curve due to increasing price of substitute goods

The above graph explains the effect of price increase of butter on demand for margarine. When the price of butter increases, the demand for margarine a substitutes to butter increases from D_0 to D_1 assuming other factors remain unchanged.

© MoE, FDRE, Ethiopia
Not to be republished

b Complementary goods are those goods which are used together to satisfy a given want. For example, pen-ink, car-petrol, etc., are good complements of each other. Complements are two goods for which an increase in the price of one leads to a decrease in the demand for the other. Complements are often pairs of goods that are used together, such as gasoline and automobiles, and computers and software.

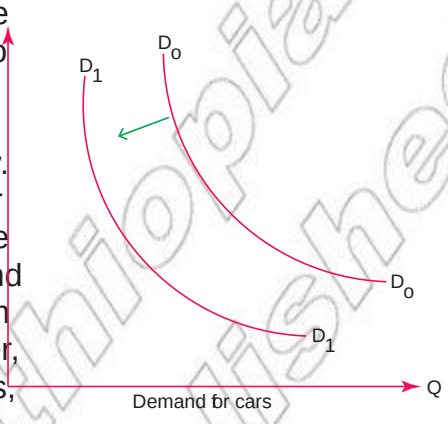


Figure 2.8: Shift in demand curve due to change in price of a complementary goods

The above demand curves explain the relationship between the demand of cars and the price of a complement (petrol). When the price of petrol increases, the demand for cars decreases.

Difference between Movement along a Demand Curve (or change in quantity demanded) and Shift in the Demand Curve (or change in demand)

- Movement along a demand curve or change in quantity demanded: Other things being equal, if the quantity demanded increases or decreases due to fall or rise in the price of a commodity alone, it is known as movement along a demand curve or change in quantity demanded. Here the movement is – either upward or downward – along the same demand curve. Change in quantity demanded occurs due to change only in the price of the commodity itself. Downward movement along the demand curve is called extension of demand, while the upward movement as contraction of demand.

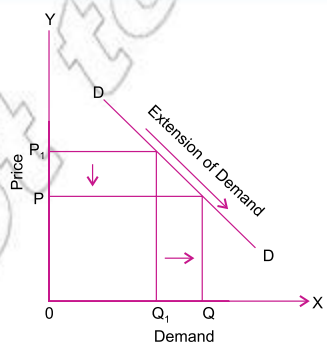


Figure 2.9: Extension of demand

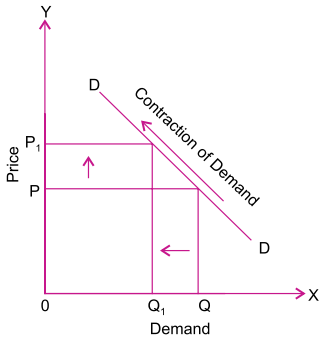
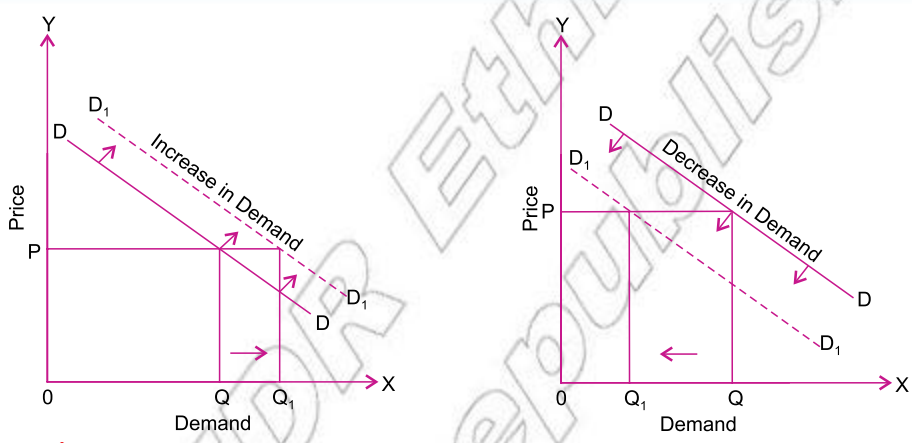


Figure 2.10: Constraction of demand

- Shift in the demand curve or change in demand: If more or less of a commodity is demanded, at the same price, due to change in factors other than the price of the commodity concerned (such as change in income, or taste or prices of other related goods, etc.), it is called shift in the demand curve or change in demand. In this situation, there is an either rightward shift or leftward shift in the demand curve itself. Here the rightward shift in the demand curve indicates increase in demand while the leftward shift indicates decrease in demand.



a) Increase in demand b) Decrease in demand

Figure 2.11: Increase and Decrease in demand

Activity 2.1

1 State the law of demand and discuss its assumptions and exceptions.

2 Explain why demand curves always slope downwards from left to right. Are there any exceptions to this?

3 An open class room discussion on questions such as:

- a Do we always buy that what we need?
- b Do we always buy that what we wish to have?
- c What are the various factors which stop us from purchasing all that we need or we desire to have?
- d Does a consumer always buy more of a commodity with an increase in his/her income? If no, give a few examples of goods/commodities where a consumer buys less of a commodity with a rise in his/her income.
- e Can say that, with a decrease in the price of a commodity, a consumer normally buys more of it?

4 Consider a market determined by a group of households, near your place of residence.
Individually or in a group, go to each of these households and collect information regarding the various quantities of milk they would like to buy at alternative prices. Prepare an individual as well as market demand schedule from the collected information.

5 List the various goods/commodities for which you feel that an increase in their prices will not significantly decrease the quantity demanded of them.

6 Suppose there are three consumers in a particular market. Leta, Abera and Shemsia. Their demand schedules are given in the following table:

Price	Leta	Abera	Shemsia
10	19	17	19
8	21	23	24
6	30	33	27
4	35	34	30
2	36	35	32
1	40	38	36

a Draw market demand schedule.
b Suppose Abera drops out of the market. Draw the new market demand schedule.
c Suppose Abera stays in the market and another person, Marta, joins that market whose quantity demand at any given price is half that of shemsia. Derive the new market demand schedule.

2.2 THEORY OF SUPPLY

At the end of this section, you will be able to:

- define concept of supply;
- examine the law of supply;
- describe the basic determinants of supply;
- construct and interpret the supply schedule graph and function; and
- identify the differences between individual and market supply.

Key Terms and Concepts

- Supply
- Supply schedule
- Supply curve
- Market supply curve

Start up Activity

Consider a given market and discuss about it in the assumption of absence of law of supply. How do hoarding practices affects the market?

Supply

Just like 'demand', the term 'supply' has a specific meaning in economics. In ordinary language the term supply is often misused and confused with the term 'stock'. Stock is the total volume of a commodity produced during a period less the quantity already sold out. We can also say it is the total volume of a commodity which can be brought into the market for sale at a short notice. On the other hand, supply means the quantity which is actually brought into the market. Many times the producers do not offer all of their stock for sale in the market, and they use practices like hoarding etc. with the objective of earning maximum profits. For example, at the time of harvest, a large part of agricultural product is kept back in cold storage and is taken out during the off-season for sale at better prices. Similarly, a part of industrial product is usually kept back in go downs and is offered for sale in the market at the time when it can fetch higher prices. We may thus say, stock is potential supply and supply may be less or, at the most, equal to the stock of commodity.

In economics we define supply as follows:

> Supply of a commodity refers to various quantities of it which producers are willing and able to offer for sale at a particular time at various corresponding prices.

Note that supply shows a relationship between quantity supplied and price of a commodity, whereas quantity supplied refers to a specific quantity which a producer is willing to sell at a specific price.

Supply Schedule

A supply schedule is a tabular statement that states the different quantities of a commodity offered for sale at different prices

Supply schedules are of two types:

i Individual supply schedule.

ii Market supply schedule.

i Individual supply schedule is a tabular statement which shows the different quantities of a commodity offered for sale by an individual firm at different prices per time period.

© MoE-EDRI Ethiopia Not to be Republished

Table 2.3: Individual supply schedule

Price (Per kg)	Quantity Supplied
5	15
8	20
12	28

The above supply schedule shows the different quantities of a commodity supplied by an individual firm at different prices. At Birr 5 per kg, the firm supplies 15 kg, but at Birr 12 per kg, the firm supplies 28 kg of the commodity.

ii Market supply scheduleis a tabular statement which shows the sum of the quantities supplied by all the sellers.

Table 2.4: Market demand schedule

Price (per kg)	Supply of Firm (X)	Supply of Firm (Y)	Market Supply (X+Y)
5	15	12	27
8	20	18	38
12	28	25	53

The above supply schedule shows the different quantities of a commodity supplied by different firms at different prices. At Birr 5 per kg, firm X supplies 15 kg, whereas firm Y supplies 12 kg, so market supply at Birr 5 per kg is 27 kg. But at Birr 12 per kg, firm X supplies 28 kg, whereas firm Y supplies 25 kg. So market supply at Birr 12 per kg is 53 kg.

Supply Curve

A supply curve conveys the same information as a supply schedule. But it shows the information graphically rather than in a tabular form.

Supply curves also are of two types:

i Individual supply curve.

ii Market supply curve.

i Individual supply curve refers tothe curve which expresses graphically the relationship between different quantities of a commodity supplied by an individual firm at different prices per time period.

© MoE Ethiopia Not to be published

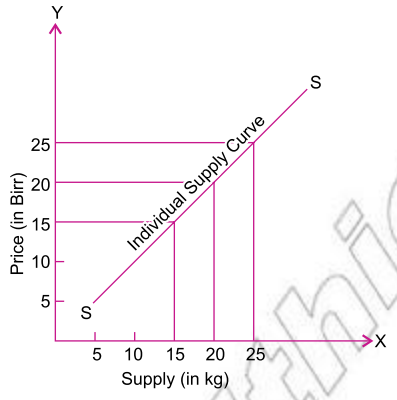


Figure 2.12: Individual supply curve

The above supply curve shows the different quantities of a commodity supplied by an individual firm at different prices.

ii Market supply curve is found by adding horizontally the individual supply curves.

Figure 2.13: Indivdual and market supply curves

The above supply curve shows the horizontal summation of individual supply curves. It expresses the relationship between different quantities of a commodity offered for sale by X and Y at different prices. Market supply is obtained by horizontally summing individual supplies at market price.

Supply Function

All the above factors influencing the supply of a commodity can be briefly expressed in the following functional relationship:

$$S_X = f(P_X, P_Y, P_F, B, Z) \qquad (2.5)$$

Where, S_X stands for the supply of a commodity X and

P_X shows the price of this commodity X, while P_Y is the price of related goods.

P_F represents price of factors of production, B represents objectives of firm and Z refers to other relevant factors. The world f shows the functional relationship between supply of X and factors affecting its supply i.e., P_X, P_Y, P_F, B, Z etc.

© MoE, FDR Ethiopia Not to be republished

Law of Supply

The Law of supply expresses the functional relationship between the price of a commodity and its quantity supplied. Price and supply are observed to be directly related. In other words, more of a commodity is supplied when price rises and less of it is supplied when price falls, provided that other factors remain the same. For example, if the price of apples rises, quantity supplied by sellers also rises and vice-versa.

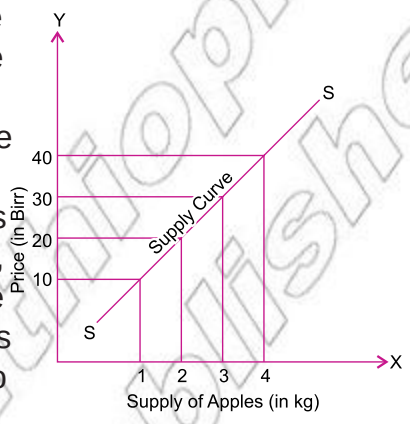


Figure 2.14: Supply curve

In the above diagram, we observe that when the price of apples is Birr 10 per kg, the quantity supplied is 1 kg. But when the price of apples rises to Birr 40 per kg, the quantity supplied rises to 4 kg.

Statement of the Law

The law of supply states that there is a direct relationship between the price of a commodity and its supply.

Or

Other things being equal, the supply of a commodity increases with an increase in its price and decreases with the fall in price.

Assumptions of the Law of Supply

Law of supply depends on the basic assumption, 'other things being equal (ceteris paribus)'. By other things we mean factors other than price which affect the supply of a commodity. For example, price of related goods, price of factors of production, objectives of firm, production technique etc. For the law, to operate there should be no change in any of these other determinants. We may summarise the assumptions of the law of supply as follows:

- There should be no change in the prices of related goods,
- There should be no change in the prices of factors of production,
- There should be no change in the goals of the firm,
- There should be no change in the state of technology,
- The income of the buyers and sellers should remain constant.

© FDRE MoE Not to be republished

Exceptions to the Law of Supply

There are some situations when the law of supply does not operate. With an increase in price, less of a commodity is supplied and vice-versa. These are known as exceptions to the law of supply. The main exceptions are as follows:

- Future Expectations About Change in Prices: Law of supply will not apply if there is an expectation about change in prices of a commodity in the near future.
- Agricultural Products: The law of supply does not apply in the case of agricultural products because their supply is governed by natural factors such as flood, drought, rainfall etc.
- Perishable Commodities: The supply of perishable commodities like milk, fruits, vegetables etc. is not affected by their prices. Producers try to sell more perishable commodities even when their prices decline.
- Good of Auction: Since supply of auction goods is limited, the law of supply does not operate in their case.
- Artistic Goods: Law of supply does not apply in the case of artistic goods since the supply of these goods cannot be changed.

Basis of the Law of Supply or Why does the Supply Curve Slope Upwards?

A supply curve normally slopes upwards to the right. It is also known as the positive slope of the supply curve, indicating a direct relationship between the price of the commodity and its supply. There are several reasons for this direct relationship, as given below:

- Expectations of Profit: If prices are high, profit expectation increases with the result that producers increase their output or production. Conversely, if the prices are low, profit expectation reduces with the result that producers reduce their output or production.
- Change in Stock: An increase in the price of a commodity induces the sellers to dispose of at least a part of their stock. Conversely, if there is a decrease in the price of the commodity, sellers retain some of the stocks.
- Entry and Exit of Firms: If, due to rising prices there are high profits, new firms enter into the market and add to the supply of the commodity. Conversely, if there is a decline in price or loss, inefficient firms withdraw from the market and stop producing that commodity.

Determinants of Supply

Supply of a commodity is determined by a number of factors. Some of these important factors are as follows:

- **Price of the Commodity:** The price of a commodity is the most important factor affecting its supply. Generally, the relationship between price and quantity supplied is direct – i.e., supply is more when price is more and vice-versa.
- **Changes in Factor Prices:** Change in factor prices have a strong influence on the supply of a good in the market. An increase in the prices of factors of production leads to an increase in the cost of production. As a result the producers will not be able to sell the same amount at the prevailing market prices. Since their production cost has gone up, the only way the same amount can be offered is at a higher price.
- **Price of Related Goods:** An increase in the price of other, related goods induces the firms to produce more of those other goods, leading to a reduction in the supply of the goods whose price has remained unchanged.
- **Objectives of the Firm:** Generally, the main objective of a firm is to maximise its profit. Profit is maximum when the difference between income and expenditure is maximum. However, besides this objective there are other objectives which a firm may pursue, such as objectives of maximum sales, maximum employment, more production, etc. In such a situation, if a firm aims at some other objective such as more employment besides the objective of maximum profit, then volume of output or supply will increase, even when profit declines.
- **State of Technology:** If there is change in the technique of production leading to fall in the cost of production, supply of a commodity will increase. On the other hand, supply of those commodities will be less whose production depends on old technology.
- **Other Factors:** Beside the main factors discussed above, there are many other factors which affect the supply of a commodity such as fiscal policy of the government, the prices which are likely to prevail in the near future, etc.

Difference Between Movement along a Supply curve (or change in Quantity Supplied) and Shift in the Supply Curve (or change in Supply)

- Movement along a supply curve (or change in quantity supplied): Other things being equal, if the quantity supplied increases or decreases due to rise or fall in the prices of the commodity alone, it is known as movement along a supply curve or change in quantity supplied. In this, we move along the same supply curve either upwards or downwards. Upward movement along the supply curve is extension of supply (that is, more quantity supplied at a higher prices) while the downward movement is contraction of supply (that is, less quantity supplied at a lower prices).

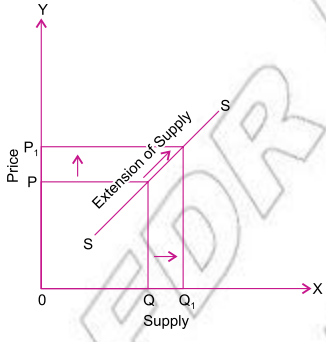


Figure 2.15: Extension of supply

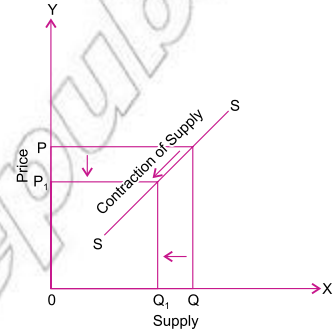
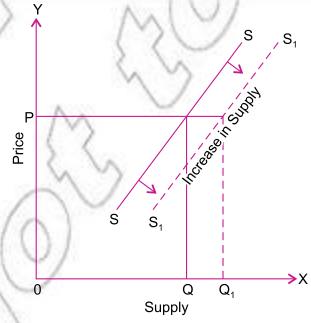
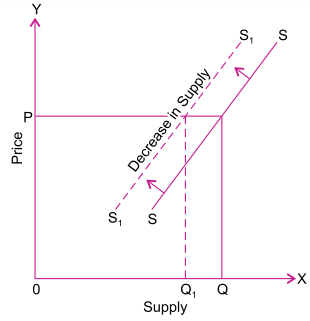


Figure 2.16: Contratction of supply

- Shift in the supply curve (or change in supply): If more or less quantity of a commodity is supplied at every alternative price due to changes in factors other than the price of the commodity concerned, it is known as shift in the supply curve or change in supply. In this situation, supply curve itself shifts either to right or to the left. Rightward shift of supply curve indicates increase in supply, while leftward shift indicates decrease in supply.



a) Increase in supply



b) Decrease in supply

Figure 2.17: An increase and decrease of supply

© NCERT Not to be republished

Thus, movement along the supply curve is caused by a change in the commodity's own price. In this situation, supply curve remains the same. On the other hand, a shift in the supply curve is caused by a change in something other than the commodity's own price. A shift in the supply curve may be caused by change in the prices of other goods, change in the prices of factors of production, change in technique of production or change in the goals of the producer.

Activity 2.2

1 Why does the supply curve slope upward to the right?
2 How are movements along the supply curve different from shift of supply curve?
3 If possible, go to a producer/seller of some commodity and collect information regarding the various quantities of it which he/she may be able and willing to supply at alternative prices. Prepare an individual supply schedule from the collected information and also draw the respective supply curve.
4 List some goods/commodities whose supply in the market has increased in recent times mainly because of advancements in technology.

2.3 MARKET EQUILIBRIUM

At the end of this section, you will be able to:

- define market equilibrium;
- compare and contrast mathematical equation and graphical representation of market equilibrium;
- show how the changes in demand and supply on equilibrium price and quantity; and
- identify the concepts of price ceiling and price floor.

Key Terms and Concepts

- Price ceiling
- Price floor
- Equilibrium
- Market equilibrium
- Equilibrium price
- Equilibrium quantity

Start up Activity

Observe the situation of your local market and list down the items that are most expensive and cheap in the market and give your rational for the differences.

In previous sub-units, we have discussed consumers' demand for goods in a market and firms' supply of goods in a market separately. Demand and supply

curves respectively tell us how much consumers demand and how much producers supply at different prices. But they do not tell us what the actual price of a good will be. We now come to the important question: How do the forces of demand and supply interact to determine market prices? We explain how forces of demand and supply help in attaining 'equilibrium', and how the 'equilibrium price' is determined. We also consider the effects of shifts in demand and supply on the equilibrium price, in this sub-unit.

The Concept of Equilibrium

In the methodologies of economics, the concept of equilibrium occupies an important place. It is employed in almost every theory of economics in the fields of price, income, and growth.

The word equilibrium means a state of balance. In the physical world, when two opposing forces that impinge on an object are in balance, and the object is held still by them, the object is said to be in equilibrium. In other words, when the object under the pressure of forces working in opposing directions has no tendency to move in either direction, the object is in equilibrium. In the same way, a system is said to be in equilibrium when its important variables show no change, and when no forces are acting on them to change their values. For example, upon reaching equilibrium, a consumer has no inclination to re-allocate his or her money expenditure. Similarly, a firm is said to be in equilibrium when it has no tendency to change its level of output by either increasing or contracting it.

In actual economic activities, equilibrium may never be actually realised. The central feature of equilibrium analysis in economics is the concept that economies tend toward equilibrium when no new forces are acting on them.

Market Equilibrium

In the context of price determination, equilibrium refers to a situation in which the quantity demanded of a commodity equals the quantity supplied of the commodity. It refers to the balance between opposite forces of demand and supply and is termed as market equilibrium.

Equilibrium Price

The price at which the quantity demanded of a commodity equals quantity supplied is known as 'equilibrium price'. The price of commodity in a market is determined by its demand and supply. At equilibrium price, demand and supply are in equilibrium.

© NCERT Not to be republished

Equilibrium Quantity

The equilibrium price is the price at which the consumers are willing to purchase the same quantity of a commodity which producers are willing to sell. The amount that is bought and sold at equilibrium price is called the 'equilibrium quantity'.

Market Equilibrium – An Illustration

With a view to understanding how the forces of demand and supply operate in a market to determine an equilibrium price and quantity, let us consider an imaginary market having a large number of buyers and sellers of a commodity, say oranges.

Table 2.5 shows the imaginary market's demand/supply schedule of oranges at different prices.

Table 2.5: Market Demand and Supply Schedule of Oranges

Price (Birr per kg)	Demand (kg)	Supply (kg)	Trend
25	200	1000	Excess supply
20	400	800	Excess supply
15	600	600	Equilibrium
10	800	400	Excess demand
5	1000	200	Excess demand

In the above schedule there is one price at which market demand is equal to market supply. This price is Birr 15 per kg because, at this price, quantity demanded is equal to quantity supplied, that is, 600 kg of oranges. Thus equilibrium price is determined as Birr 15 per kg. It is the only price at which the maximum number of buyers and sellers are satisfied. So long as market demand and supply remain unchanged, the price will neither tend to rise nor fall below this equilibrium price.

In Case of Excess Demand

Excess demand for a product means that the consumers want more than what the producers are willing to supply. If at a given price of a commodity, demand is in excess of supply, competition among buyers will push the price up to the point at which demand becomes equal to supply. Suppose the actual price of oranges prevailing at a particular time in the market is Birr 10 per kg. At this price, demand for oranges is for 800 kg, whereas supply is 400 kg, that is, there

is excess demand of 400 (= 800 – 400) kg. This will create competition among buyers to buy oranges which are in short supply and push the price up till it reaches the equilibrium price of Birr 15 per kg, where demand becomes equal to supply (= 600 kg of oranges).

In Case of Excess Supply

Excess supply of a product means that the consumers want less than what the producers are willing to supply. If at a given price, the quantity supplied of a commodity exceeds the quantity demanded, competition among sellers will push the price down to the point at which demand becomes equal to supply. Suppose at a particular time, price of oranges prevails at Birr 20 per kg at which the demand is for 400 kg against a supply of 800 kg, i.e., there is excess supply of 400 kg. Competition among sellers to sell their oranges will push down the price till it reaches Birr 15 per kg. Ultimately the price will settle at Birr 15 per kg at which demand is 600 kg oranges and supply is also 600 kg. This indicates demand and supply are holding each other in balance and the equilibrium price has been reached. Note that in the above illustration, the equilibrium price is Birr 15 per kg and the equilibrium quantity is 600 kg.

Graphical Presentation of Market Equilibrium

Determination of equilibrium price and equilibrium quantity can also be illustrated graphically with the help of a market demand curve and market supply curve.

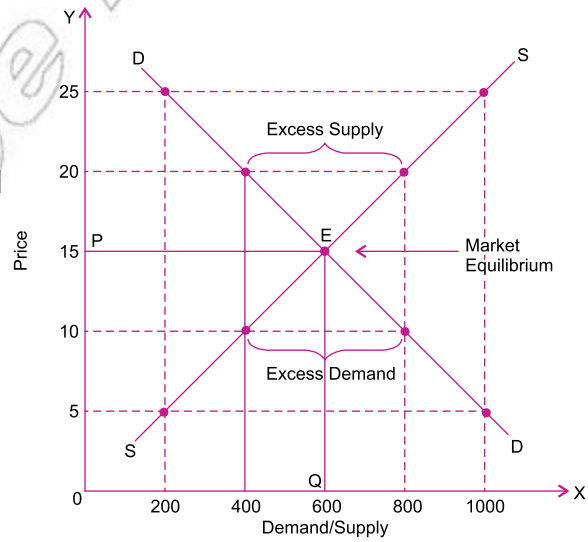


Figure 2.18: Market equlibrium

The market demand/supply schedule of the previous illustration has been shown in the above graph in which DD is the demand curve and SS is the supply curve.

© MoE Ethiopia
Not to be republished

Both the curves intersect each other at point E where equilibrium price is OP (Birr 15) and quantity demanded and supplied are equal to OQ (600 kg). Thus OP (Birr 15) will be equilibrium price and OQ (600 kg) will be equilibrium quantity. In short, graphical equilibrium price of a commodity is the point of intersection of demand curve and supply curve. The situation of excess demand and excess supply have also been represented in the graph.

Mathematical Analysis of Market Equilibrium

We can find out the equilibrium price and equilibrium quantity through a mathematical analysis of market equilibrium, too. For this purpose, we formulate the market demand function and market supply function from the given data (if not given in ready form) and then equate the two. The process is better illustrated through the following examples:

Example 1: Let there be 5000 identical buyers of a commodity X in a market with an individual demand function of $D_x = 8 - P_x$, and 1000 identical sellers of commodity X with an individual supply function of $S_x = 20\ P_x$, where D_x is quantity demanded, S_x is quantity supplied and P_x is price of the commodity X. For calculating the equilibrium price and equilibrium quantity, we formulate the market demand and market supply functions for the commodity X.

Solution:

Market demand function = Number of buyers × Individual demand function

$= 5{,}000 \times (8 - P_x) = 40{,}000 - 5{,}000\ P_x$

Market supply function = Number of sellers × Individual supply function

$= 1000 \times 20\ P_x = 20{,}000\ P_x$

On equating the two market functions, we get:

$40{,}000 - 5{,}000\ P_x = 20{,}000\ P_x$ or $25{,}000\ P_x = 40{,}000$

$\therefore P_x = \frac{40{,}000}{25{,}000} = 1.6$

Hence, equilibrium price of commodity X is Birr 1.6. On substituting the value of P_x in either of the two functions, say market demand function, we get:

Equilibrium quantity = $40{,}000 - 5{,}000\ P_x$

$= 40{,}000 - 5{,}000 \times 1.6 = 40{,}000 - 8{,}000 = 32{,}000$ units

> **Note:**
>
> We will get the same value for the of equilibrium quantity if we substitute the value of P_x in market supply function.

Example 2: Assume in a market individual supply function of a commodity A is given by $S_A = 2P_A - 3$ and individual demand function is $D_A = 12 - 4P_A$.

There are 200 suppliers of commodity A with identical supply function and there are 8,000 buyers of the commodity A with identical demand function. Where; S_A is quantity supplied, D_A is quantity demanded and P_A price of commodity A. Find market equilibrium price and quantity demanded.

Solution:

Market demand function = Number of buyers × Individual demand function

$$= 8{,}000 \times (12 - 4P_A) = 96{,}000 - 32{,}000P_A$$

Market supply function = Number of sellers × Individual supply function

$$= 200 \times (2P_A - 3) = 400P_A - 600$$

at equilibrium: market demand = market supply

$$96{,}000 - 32{,}000P_A = 400P_A - 600$$

$$96{,}000 + 600 = 400P_A + 32{,}000P_A$$

$$96{,}600 = 32{,}400P_A$$

$$P_A = 2.98 \text{ (approximately)}$$

Hence, equilibrium price of commodity A is Birr 2.98. On substituting the value of P_A in either of the two functions, say market demand function, we get:

Equalibrium quantity = 400 × 2.98 – 600 = 1192 – 600 = 592

Demand and Supply Curves do not Intersect each other – Is it possible?

A situation may arise when there are prospective consumers and producers of a commodity but still it is not produced. Why? It happens when the price at which producers are ready to produce is so high that the consumers are not willing to buy even a single unit of the commodity. In other words, in graphic terms, the demand curve and supply curve do not intersect each other at any positive quantity. As a result the product will not be produced. This shows the industry (of the product) is not economically viable.

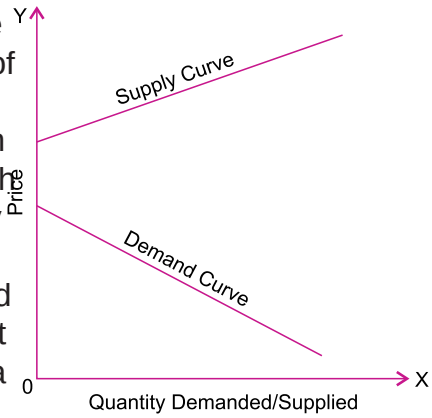


Figure 2.19: Non crosing demand and supply curves

Thus a non-viable industry is one whose demand and supply do not intersect each other at any positive quantity. It is an industry in which costs are too high for any positive output to be produced.

Effects of changes in Demand and Supply on Equilibrium Price and Equilibrium Quantity

By now we understand that equilibrium price and equilibrium quantity are determined at a point where demand equals the supply or where demand and supply curves cut each other. So far, we have assumed the supply and demand curves remain unchanged. But a shift in one or both of them causes the point of equilibrium to change. Let us recall that a rightward shift in the relevant curve means that more is demanded or supplied at a given price, while a leftward shift means less is demanded or supplied at that price. Now we shall study how a shift either in the demand or in the supply curve (that is, change in demand or supply) affects equilibrium price and quantity in the market. We discuss the effects of these shifts (changes) under various heads.

Effects of Change in Demand (or Shifts in the Demand Curve) when Supply Remains Constant

There can be two situations of change in demand.

i Effect of Increase in Demand: Under the conditions of stable supply curve, if there is increase in demand (that is, a rightward shift of the demand curve), both equilibrium price and equilibrium quantity increase. When demand curve shifts to the right (DD to D_1D_1), the equilibrium price (OP to OP_1) and equilibrium quantity (OM to OM_1) both increase. This is shown in Figure 2.20

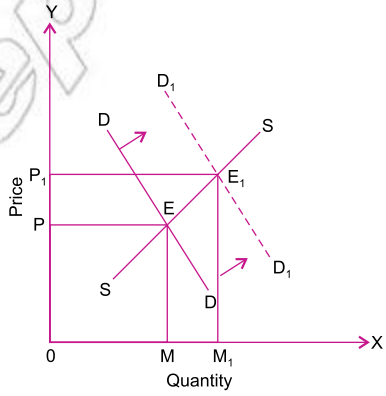


Figure 2.20: Effect of increase demand

ii Effect of Decrease in Demand: Under the conditions of stable supply curve, if there is decrease in demand (i.e., a leftward shift of the demand curve), both the equilibrium price and equilibrium quantity decreases. When demand curve shifts to the left (DD to D_1D_1), both the equilibrium price (OP to OP_1) and equilibrium quantity (OM to OM_1) decrease. This is shown in Figure 2.21

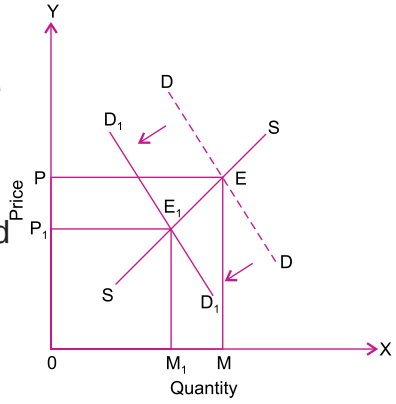


Figure 2.21: Effect of decreasing demand

In brief, with the same supply curve:

- the effect of increase in demand is higher equilibrium price and larger equilibrium quantity, and
- the effect of decrease in demand is lower equilibrium price and smaller equilibrium quantity.

Effects of Change in Supply (or Shifts in the Supply Curve) when Demand Remains Constant

i Effect of Increase in Supply: Under the conditions of stable demand curve, if there is increase in supply (that is, a rightward shift of the supply curve), equilibrium price decreases and equilibrium quantity increases. When supply curve shifts to the right, price falls (OP to OP_1) but equilibrium quantity increases (OM to OM_1), as shown in Figure 2.22

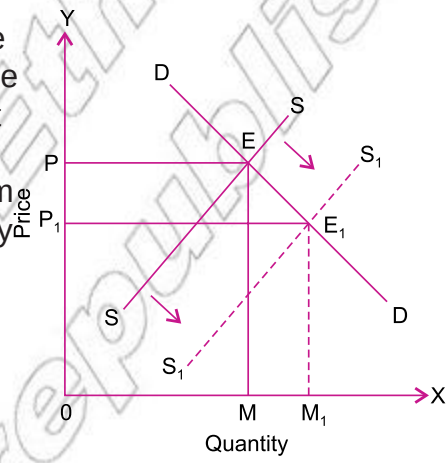


Figure 2.22: Effect of increase in supply

ii Effect of Decrease in Supply: Under the conditions of stable demand curve, if there is a decrease in supply (that is, a leftward shift to the supply curve), equilibrium price increases and equilibrium quantity decreases. When supply curve shifts to the left price rises (OP to OP_1) but equilibrium quantity decreases (OM to OM_1), as shown in Figure 2.23

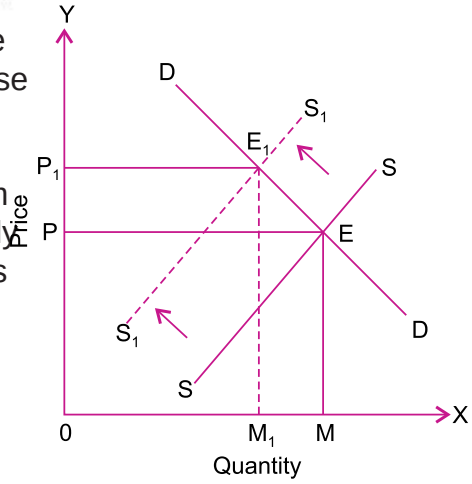


Figure 2.23: Effect of decrease in supply

In brief, with the same demand curve:

- the effect of increase in supply is lower equilibrium price and larger equilibrium quantity, and

© MoE FDR Ethiopia Not to be republished

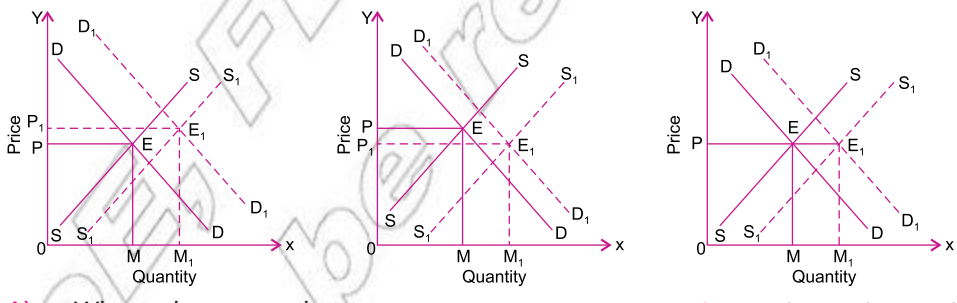
- the effect of decrease in supply is higher equilibrium price and smaller equilibrium quantity.

Effect of Simultaneous Change in Demand and Supply (Simultaneous Shifts in Demand and Supply Curves)

Although there are various possibilities, we discuss below the two main possibilities:

i When Both Demand and Supply Increase: If both demand and supply increase (that is, both demand curve and supply curve shift to the right), the equilibrium quantity would certainly rise. But the equilibrium price may rise, fall or remain unchanged. It depends on the comparative increase in demand and supply.

- a If the increase in demand is greater than the increase in supply, the equilibrium price rises. (Figure 2.24A)
- b If the increase in demand is smaller than the increase in supply, the equilibrium price falls. (Figure 2.24B)
- c If the increase in demand and increase in supply are equal, the equilibrium price remains unchanged. (Figure 2.24C)



A) When increase in demand is greaterthan increase in supply

B) When increase in demand smallerthan increase in supply

C) When increasing demand and increase in supply are equal

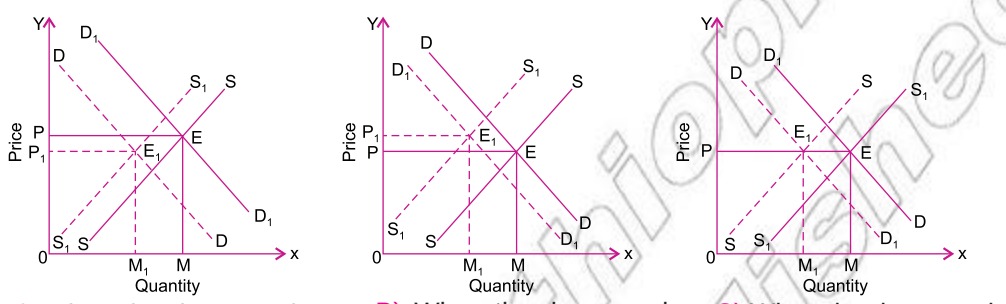
Figure 2.24: When supply and demand increase at various ratios

ii When Both Demand and Supply Decrease: If both demand and supply decrease (that is both demand curve and supply curve shift to the left), the equilibrium quantity would certainly fall. But the equilibrium price may rise, fall or remain unchanged.

- a If the decrease in demand is greater than the decrease in supply, the equilibrium price falls. (Figure 2.25A)
- b If the decrease in demand is smaller than the decrease in supply, the equilibrium price rises. (Figure 2.25B)

© MoE FDRE Ethiopia Not to be republished

c If the decrease in demand and decrease in supply are equal, the equilibrium price remains unchanged (Figure 2.25C).



A) When the decrease in demand is greater than the decrease in supply

B) When the decrease in demand is smaller than the decrease in supply

C) When the decrease in demand and decrease in supply are equal

Figure 2.25: When demand and supply decrease at different ratios

The above discussion makes it clear tha
the effect of changes in demand and supply
on the equilibrium price depends on the
strength of the relative changes in demand
and supply. The only certain thing is that
the equilibrium price in all circumstances
is determined at a point where demand
curve intersects the supply curve.

Note:

It is possible that the demand curve shifts rightward and supply curve leftward. In that case, equilibrium price will definitely increase but quantity may increase or decrease. Similarly, if demand curve shifts leftward and supply curve rightward, equilibrium price will decrease, but quantity may increase or decrease.

We summarise below the main causes of changes in demand and supply.

Table 2.6: Effect of Changes in Demand and Supply

Changes in demand and supply	Effect on equilibrium price	Effect on equilibrium quantity
Increase in demand	price rises	quantity increases
Decrease in demand	price falls	quantity decreases
Increase in supply	price falls	quantity increases
Decrease in supply	price rises	quantity decreases
Increase in both (i.e., demand and supply)	price may rise, fall or remain unchanged	quantity increases
Decrease in both (i.e., demand and supply)	price may rise, fall or remain unchanged	quantity decreases

Activity 2.3

1 Prepare a graphical presentation of market equilibrium from the following data:

Price (Birr)	Demand (units)	Supply (units)
1	500	100
2	400	200
3	300	300
4	200	400
5	100	500

Also, read the equilibrium price and equilibrium quantity from the graph, and identify the market trends.

2 Prepare a demonstration (on chart paper or on your personal computer) that depicts, through diagrams, the impact of the following changes on market equilibrium:

a An increase in supply when demand remains constant. Figure 2.22

b A decrease in supply when demand remains constant. Figure 2.23

c An increase in demand when supply is constant. Figure 2.20

d A decrease in demand when supply is constant. Figure 2.21

Effects of Government Intervention on Market Equilibrium

Government may intervene in the market in many ways; one of the more prominent ways is of price control. In the interest of consumers and producers, the government executes the policy of price control by intervening in the market. This policy of price-control may have two variants:

- maximum price and
- minimum price.

In both the situations decisions are taken on the basis of demand and supply analysis.

Maximum Price Fixation (Price Ceiling)

Sometimes the supply of a commodity is so short that it creates shortages in the market and common consumers are unable to get the commodity from the market. Competitive prices are so high that they become out of reach for common consumers, only the rich can purchase and consume the commodity. In such a situation government comes forward and fixes the maximum price for the commodity. This process is known as price ceiling. We discuss the consequences of price ceiling with the help of Figure 2.26.

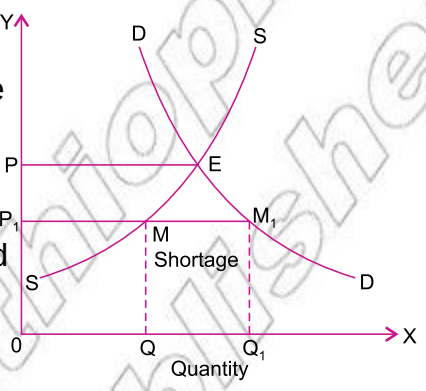


Figure 2.26: A price celling

In the diagram demand curve DD intersects the supply curve SS at point E which gives OP as the equilibrium price. If at this stage, the government feels that this free market equilibrium-price is too high for the common and poor consumers then the government fixes the maximum price at OP_1 below the level of equilibrium price (that is, OP). At this OP_1 price the quantity demanded is equal to OQ_1 while the quantity offered for supply will only be equal to OQ. Thus, it is revealed that supply is less than the demand and it leads to the situation of shortages. We may conclude, price ceiling causes shortages.

Minimum Price Fixation (Price Floor)

Whenever government feels that the competitive price determined by the forces of demand and supply in a free market is not fair from the producers' point of view, government announces a minimum price to protect the interests of the producers. This is also termed as support price or price floor. It is very common with governments these days to protect the interests of the farmers. We discuss the consequences of price floor with the help of Figure 2.27.

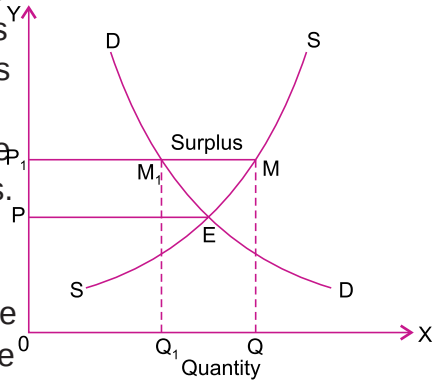


Figure 2.27: A price floor

© Not to be republished

The intersection of demand curve DD and supply curve SS at the point E, gives the equilibrium price OP in the above diagram. If the producers feel that this free market price is low, they exert pressure on the government to enhance this price through legislation. In view of producers' interests government declares as OP_1 the minimum support price, which is above the level of equilibrium price. At this OP_1 price the demand for the commodity is OQ_1 while the supply is equal to OQ. Clearly the supply in this situation is greater than the demand. This creates the situation of surplus in the market which is equivalent to Q_1M in the diagram. Thus, we may conclude price floor causes surplus

2.4 ELASTICITY OF DEMAND AND SUPPLY

At the end of this section, you will be able to:

- define the concept of elasticity;
- identify and explain types of elasticity;
- calculate and derive the formula of price elasticity of demand;
- assess the determinant of price elasticity of demand;
- construct and compute the price elacticity of demand equation and graphical representation;
- analyze the relationship between price elasticity and total revenue;
- define the concept of income elasticity;
- calculate and drive the formula of income elasticity of demand;
- define the concept of cross-price elasticity demand; and
- calculate and drive the formula of cross-price elasticity of demand.

Key Terms and Concepts

- Elasticity
- Point elasticity
- Arc elasticity
- Elastic demand
- Inelastic demand
- Unitary elastic

Start-up Activity

How does your family respond to a price increase in a market? Does it continue purchasing the same amount of goods and services it used to while prices of goods and services rises up? Does it respond similarly to all goods and services it consumes? Do you think there are goods or services we shall be forced to consume the same amount as before even if prices goes up?

Elasticity is a measure of responsiveness of one variable to another. In economics, the concept of elasticity is very crucial and is used to analyse the quantitative relationship between price and quantity purchased or sold. Accordingly, we have the concepts of elasticity of demand and elasticity of supply. In the present sub-unit, we study these concepts, their determinants and the measurement of various types of elasticities.

Elasticity of Demand

It is price elasticity of demand which is usually referred to as elasticity of demand. But, besides price elasticity of demand, there are various other concepts of demand elasticity. As we know, demand for a good is determined by its price, incomes of the people, prices of related goods, etc. Quantity demanded of a good will change as a result of the change in the size of any of these determinants of demand.

Definition:

Elasticity of demand refers to the degree of responsiveness of quantity demanded of a good to a change in its price, or change in income, or change in prices of related goods.

Accordingly, there are three kinds of demand elasticity: price elasticity, income elasticity and cross elasticity. Price elasticity of demand refers to the responsiveness of the quantity demanded of a good to a change in its price. Income elasticity of demand refers to the sensitiveness of the quantity demanded to a change in income. Cross elasticity of demand means the degree of responsiveness of the demand of a good to a change in the price of a related good, which may be either a substitute for it or a complementary with it.

Price Elasticity of Demand

Price elasticity of demand means degree of responsiveness of demand to change in price. It indicates how consumers react to changes in price. The greater the reaction, the greater will be the elasticity, and the lesser the reaction, the smaller will be the elasticity. Price elasticity of demand is a measure of how much the quantity demanded of a good responds to a change in the price of that good, computed as the percentage change in quantity demanded divided by the percentage change in price.

For example, demand for commodities like clothes, fruit etc. changes when there is even a small change in their price, whereas demand for commodities which are

basic necessities of life, like salt, food grains etc., may not change even if price changes, or it may change, but not in proportion to the change in price.

$$\text{Price elasticity of demand } (e_p) = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in price}}$$

Determinants of Price Elasticity of Demand

There are many factors which determine the price elasticity of demand. The main factors are:

- **Availability of substitutes:** The most important determinants of the price elasticity of demand is the number and kind of substitutes available for a commodity. If a commodity has many close substitutes, its demand is likely to be elastic. Even a small fall in price will induce more people to buy this commodity rather than its substitutes. For instance, coffee and tea may be considered as close substitutes for one another. When the price of coffee falls, but the price of tea does not, many consumers will buy more coffee and less of tea since coffee has become relatively cheap. On the other hand, if a good has no or weak substitutes, the demand for it would be inelastic. This is the case with milk, salt and sugar which do not have good substitutes. Thus, when the price of milk increases, the quantity demanded will not decrease much, and, similarly, when the price falls, the quantity demanded will not increase much. In general, a commodity with close substitutes tends to have an elastic demand, and one with weak substitutes has an inelastic demand.
- **Nature of the commodity:** One of the important determinants of price elasticity of demand is nature of the commodity, that is, whether it is a 'necessary' or a 'luxury' or a commodity of 'comfort'. Demand for necessities, such as food items, is generally inelastic. These goods are essential for existence. On the other hand, 'luxuries' and 'comforts' are not essential for existence and their consumption can be dispensed with or postponed. Thus, their demand changes by large amounts due to small changes in price. For example, a fall in the price of air conditioners, colour TV sets, and so forth may bring about a large increase in the quantities demanded of these goods. Generally the demand for necessities is inelastic and the demand for luxuries and comforts is elastic.
- **Proportion of income spent:** Elasticity of demand for a commodity depends upon the proportion of her/his income which the consumer spends on it. The smaller the proportion of income spent on a commodity, the smaller will be the elasticity of demand and vice-versa. The demand for soap, salt, matches, etc., is highly inelastic since the consumer

spends a very small proportion of his income on them. On the other hand, the demand for clothes, furniture, etc. is likely to be elastic since the consumer spends a large fraction of his income on these goods.

- The number of uses of a commodity: Elasticity of demand depends also upon the number of uses a commodity can be put to. The greater the number of uses to which a commodity can be put to, the greater will be its price elasticity of demand. Electricity, for example, can be used for lighting, cooking, heating, etc. If electricity is very expensive, it might be used for lighting only. As the price of electricity falls, it might be used for less important uses like cooking and heating. Accordingly, the demand for electricity will change greatly with a change in its price and, therefore, it is relatively elastic.
- Time factor: The elasticity of demand depends on the size of the time period – short period or long period. Price elasticity is generally low for short periods as compared to long periods. This is for two reasons. Firstly, it takes time for consumers to adjust their tastes, preferences and habits. Secondary, new substitutes may be developed in the long run. Therefore, if the price of a commodity rises, the demand for it will be inelastic in the short-run as the substitutes may not be available. But in the long-run, demand will be elastic as the consumers may switch over to new substitute.
- Postponement of consumption: Elasticity of demand depends on the possibility of postponement of consumption as well. Demand for a commodity is elastic if its consumption can be postponed. The consumption of clothing may be postponed and, therefore, a rise in its price may lead to a large fall in its demand. But the consumption of food items cannot be postponed. Therefore, their demand is inelastic.
- Price range: Price elasticity of demand depends upon the range of prices. Demand for a commodity tends to be inelastic at very high and very low prices, and elastic within the moderate range of prices. At a very high price of the commodity, the demand for it will come from rich persons only. A rise or fall in its price will not affect its demand much, as it would still be out of reach for most of the people. If, on the other hand, the price of the commodity is very low, all those who want to buy it would have already purchased this commodity. A further fall in the price of the commodity, therefore, will not lead to much increase in amount demanded. However, the demand for the commodity is elastic within the moderate range of prices, as the commodity will be within the reach of a large number of consumers.

- **Habits of the consumers:** Price elasticity of demand depends also upon whether or not the consumers are in the habit of using a commodity. If consumers are in the habit of consuming some commodities, they will continue to consume them even at higher prices. For instance, a smoker does not reduce much the number of cigarettes smoked as the price of cigarettes goes up. The demand for such commodities is usually inelastic.

Measurement of Price Elasticity of Demand

The measurement of elasticity of demand can be looked at from two view points:

i point elasticity and

ii arc elasticity.

i **Point Elasticity:** When price elasticity of demand is measured at a point on a demand curve, it is called point elasticity. In the following Figure 2.28 if we want to know the elasticity of demand at a point R on the demand curve, we call it point elasticity. The method used for measuring point elasticity is called Point Method.

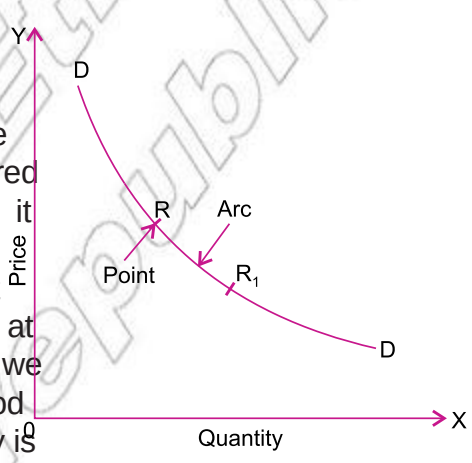


Figure 2.28: Point and arc elasticities

ii **Arc Elasticity:** When elasticity of demand is measured over a finite range or 'arc' of a demand curve, it is called arc elasticity of demand. For example, the measure of elasticity between point R and R_1 on the demand curve is the measure of arc elasticity.

Thus, $e_p = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$

$$= \frac{\frac{\text{\% change in quantity demanded}}{\text{Initial quantity}} \times 100}{\frac{\text{\% change in price}}{\text{Initial price}} \times 100}$$

$$= \frac{\frac{Q}{Q} \times 100}{\frac{P}{P} \times 100} = \frac{Q}{Q} \div \frac{P}{P}$$

$$= \frac{Q}{Q} \times \frac{P}{P} = \frac{Q}{P} \times \frac{P}{Q}$$

Thus: $|e_p| = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$ (point price elasticity of demand) (2.6)

Where; e_p stands for price elasticity of demand,

Q stands for quantity (initial), P stands for price (initial),

Δ 4 V W D Q G V I R U F K D Q J H L Q T X D Q W L W \ ¨ 3

Arc Price Elasticity of Demand

Arc price elasticity of demand measures price elasticity of demand between two points. The formula for arc price elasticity of demand arc is given by:

Arc price elasticity of demand = (2.7)

where: $\%\Delta Q = \frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}}$, $\%\Delta P = \frac{P_2 - P_1}{\frac{P_1 + P_2}{2}}$

Thus, $\bar{e}_p = \frac{\frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}} \times 100}{\frac{P_2 - P_1}{\frac{P_1 + P_2}{2}} \times 100} = \frac{\frac{Q_2 - Q_1}{Q_1 + Q_2}}{\frac{P_2 - P_1}{P_1 + P_2}} = \frac{Q_2 - Q_1}{Q_1 + Q_2} \times \frac{P_1 + P_2}{P_2 - P_1}$

by rearranging, it becomes $\bar{e}_p = \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1 + P_2}{Q_1 + Q_2}$

The arc elasticity formula is used if the change in price is relatively large. It is a more accurate measure of elasticity than point elasticity method.

Example: Consider a market for music CDs. When the price of CDs is birr 20 per unit, consumers by 6 units per year. When the price rises to birr 24 per unit consumers buy 4 CDs per year. Find price elasticity of demand for CDs using arc method.

Solution: Given P_1 = Birr 20, P_2 = Birr 24, Q_1 = 6, Q_2 = 4

$\bar{e}_p$ [illegible]

$= \frac{2}{4} \quad \frac{44}{10} \quad |2.2| \quad 2.2$

Remember that we ignore the minus sign when calculating price elasticity.

Mathematically speaking, price elasticity of demand is a negative number because of negative slope of the demand curve. In view of the negative slope

© MoE FDR Ethiopia Not to be republished

of the demand curve, the price and the quantity change in opposite directions from each other. Thus, while calculating price elasticity of demand by percentage method, the common practice is to ignore the negative signs, i.e., we should take only the absolute values and not their signs.

Another important feature of the price elasticity of demand is that it does not depend on the units of measurement of quantity of demand – whether kg of rice or litres of petrol – or the measure of price – whether in Ethiopian Birr or in U.S. dollars. It is a unit-free measure. Therefore, we can compare the price sensitivity of demand for different goods regardless of the units for measuring either price or quantity.

Let us calculate elasticity of demand by using the point method by taking a numerical example. Suppose the price of the commodity falls from Birr 5 to Birr 4 and quantity demanded increases from 100 units to 150 units.

In this example, Given $Q_1 = 100$, $Q_2 = 150$, $P_1 = 5$, $P_2 = 4$

û 4 ± 3 'P| = |4 D Q5|G = 1

| | —— — = — × —— =

that is, at price = Birr 5, if price decreases by 1%, quantity demand increases by 2.5%.

Geometrically, price elasticity of demand can be measured with the help of what is known as 'Point Method.' According to this method, price elasticity of demand at any point on the demand curve can be measured by:

(2.8)

Let us measure price elasticity of demand at point R on a linear or a straight line demand curve, AB, which is intercepted by both the axes.

$$|e_P| \text{ at point R} = \frac{\text{Lower line segmen}}{\text{Upper line segmen}}$$

Here, $|e_P| > 1$ because RB > RA.

$$= \frac{RB}{RA}$$

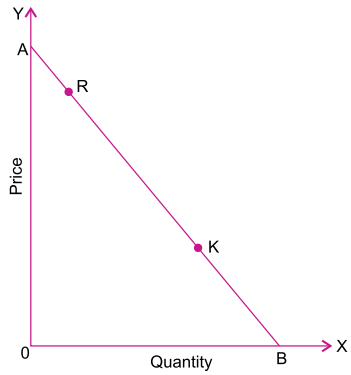


Figure 2.29: Price elasticity of demand at a point

© MoE, FDRE Ethiopia Not to be republished

Similarly, if we want to measure elasticity at any other point on the demand curve, say at K,

$$|e_P| \text{ at } K = \frac{KB}{KA}$$

Here, $|e_P| < 1$ since KB < KA.

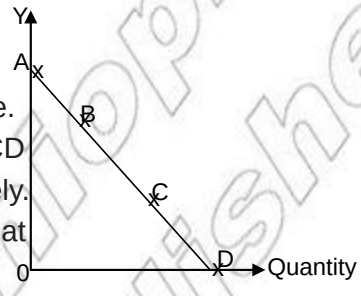


Figure 2.30:

Example: Consider the following demand curve. Assume the line segments AB, BC and CD have lengths of 3, 4 and 5 units respectively. Then, calculate price elasticity of demand at points A, B, C, and D.

Solution: Given: lengths of AB = 3 units, C = 4 units and CD = 5 units

e_p at point A $\frac{AB}{\text{point A}}$ $\frac{AB}{0}$ $\frac{3}{0}$ d

note that the length of a point is zero

e_p at point B $\frac{BD}{BA}$ $\frac{BC \quad CD}{BA}$ $\frac{4 \quad 5}{3}$ 3

e_p at point C $\frac{CD}{CA}$ $\frac{CD \quad CD}{CB \quad BA}$ $\frac{5}{4 \quad 3}$ = 0.71 (approximately)

e_p at point D $\frac{0}{DA}$ $\frac{0}{12}$ 0

Range of Elasticities on a Linear Demand Curve

We can use the point method to illustrate elasticities at various points on a linear demand curve.

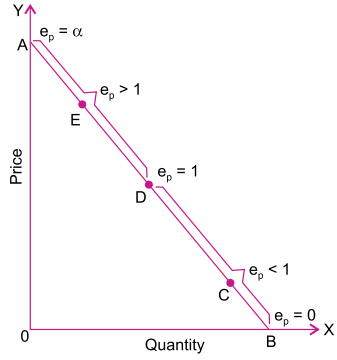


Figure 2.31: Range of elasticities

1 At point A (where the demand curve touches the vertical axis)

$$e_P = \frac{\text{Line segment below A}}{\text{Line segment above A}}$$

$$= \frac{AB}{0} = \text{infinity } (\infty)$$

At any point above the mid-point but below A, say at E

$$|e_P| \text{ at } E = \frac{BE}{EA} > 1$$

because the lower segment is greater than the upper segment

© MoE FDRE Ethiopia Not to be republished

2 At the mid-point, D

$$|e_p| \text{ at } D = \frac{BD}{DA} = 1$$

because the lower segment equals the upper

3 At any point below the mid-point but above B, say at C

$$|e_p| \text{ at } C = \frac{BC}{CA} < 1$$

because the lower segment is smaller than the upper segment

4 At point B (where the demand curve touches the horizontal axis)

$$|e_p| \text{ at } B = \frac{0}{AB} = 0$$

Types of Elasticity of Demand

Elasticity of demand is generally classified into the following five categories:

i Perfectly inelastic demand ($|e_p| = 0$): When the demand of a commodity does not change at all, irrespective of any change in its price, it is said to be perfectly inelastic demand. Here elasticity of demand = 0 (Zero).

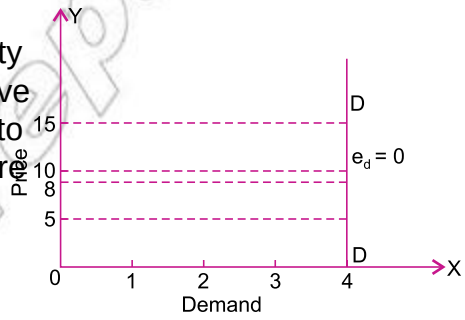


Figure 2.32: Perfectly inelastic demand

The demand curve is vertical to the x-axis when elasticity of demand is perfectly inelastic.

ii Less than unit elastic demand ($|e_p|<1$): When percentage change in demand of a commodity is less than the percentage change in its price, it is said to be less elastic or less than unit elastic demand. Here elasticity of demand is less than 1.

Price (Birr per kg)	Demand (kg)
6	3
2	4

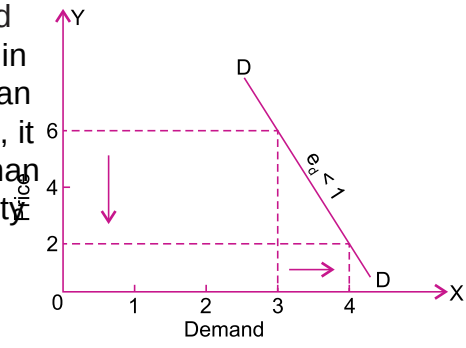
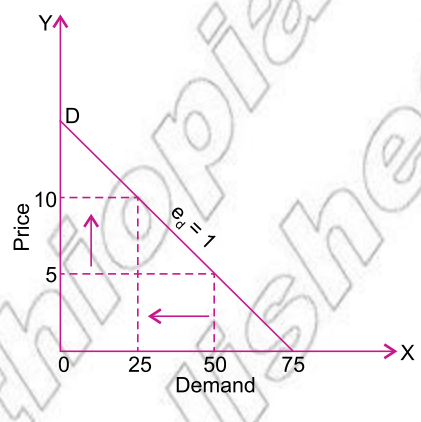


Figure 2.33: Less than unit elastic demand

© MoE, FDRE Ethiopia Not to be republished

iii Unit elastic demand ($|e_p| = 1$): When percentage change in the demand of a commodity and percentage change in price are equal, it is said to be unit elastic demand. Here elasticity of demand is equal to 1.

Price (Birr per kg)	Demand (kg)
5	50
10	25



iv More than unit elastic demand ($|e_p| > 1$): When percentage change in demand of a commodity is more than the percentage change in its price, it is called more than unit elastic demand. Here elasticity of demand is more than 1.

Price (Birr per kg)	Demand (kg)
3	100
4	25

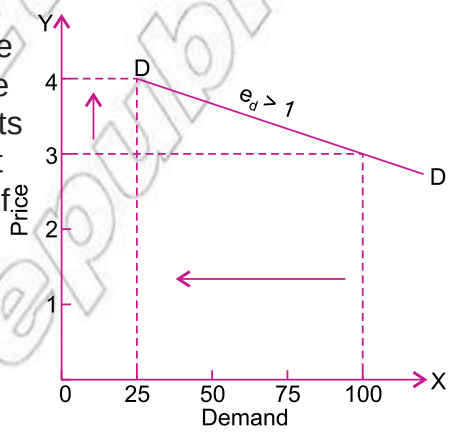


Figure 2.34: More than unit elastic demand

v Perfectly elastic demand ($|e_d| = \infty$): When demand of a commodity rises or falls to any extent without or with very little change in price, the demand for the commodity is said to be perfectly elastic or infinitely elastic demand. Here elasticity of demand $= \infty$.

Price (Birr per kg)	Demand (kg)
4	1
4	6

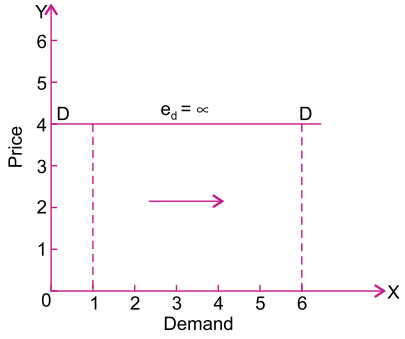


Figure 2.37: Perfeclty elastic demand

Demand curve is horizontal when elasticity of demand is perfectly elastic.

© MoE | Not to be republished

Demand curve showing different types of price elasticities

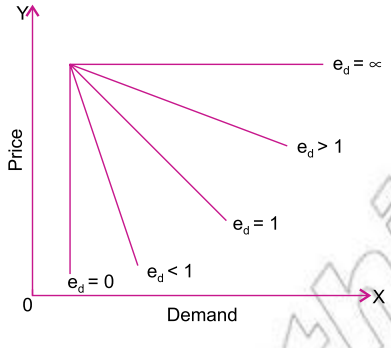


Figure 2.38: Different levles of price elasticities

Table 2.7: Types of Price Elasticities of Demand

Value of Elasticity of Demand	Types of Price Elasticity of Demand	Description
$\|e_d\| = 0$	Perfectly Inelastic	Change in price does not affect demand at all
$\|e_d\| < 1$	Less than Unit Elastic (inelastic)	% change in demand is less than % change in price
$\|e_d\| = 1$	Unit Elastic	% change in demand is equal to % change in price
$\|e_d\| > 1$	More than Unit Elastic (elastic)	% change in demand is more than % change in price
$\|e_d\| =$	Perfectly Elastic	Demand changes infinitely

Price Elasticity of Demand and Total Revenue

Total revenue by definition is equal to price times quantity (TR = P × Q). If producers sell 10 units of a commodity at Birr 4 each, total revenue is Birr 40 (4 × 10). When the price of a commodity increases, it is not necessary that the total revenue of the seller will also increase. Rather, the change in total revenue (if any) depends upon the responsiveness of buyers to a change in price. We may say, the effect of a change in price on the total revenue, depends upon the price elasticity of demand for the commodity. We discuss the relationship between price elasticity of demand and total revenue under the following three heads:

i When Demand is Price-Inelastic ($|e_p| < 1$): If the demand for a commodity is price-inelastic, the percentage decrease in quantity demanded is less than the percentage increase in price. This leads to an increase in total revenue due to increase in price. Similarly, a price decrease reduces the total revenue, in this case.

ii When Demand is Price-Elastic ($|e_p| > 1$): If the demand for a commodity is price-elastic, the percentage decrease in quantity demanded is more than

the percentage increase in price. This leads to a decrease in total revenue due to an increase in price. On the other hand, a price decrease increases the total revenue, in this case.

iii When Demand is Unit-Elastic ($|e_p| = 1$): In this case, the percentage change in quantity demanded is equal to the percentage change in price. As a result, an increase or decrease in price leads to no change in the total revenue.

Table 2.8: Effects of total revenue to elasticity

Change in Price	Impact of Total Revenue		
	$\|e_p\| < 1$	$\|e_p\| > 1$	$\|e_p\| = 1$
Increase	Increase	Decrease	No Change
Decrease	Decrease	Increase	No Change

Income Elasticity of Demand

Income elasticity of demand is the ratio of proportionate change in demand to proportionate change in income. This elasticity explains as to what will be the effect on demand when income of the consumer changes provided other things (price of the commodity, tastes and preferences of the consumer, price of related goods etc.) remain constant. In other words, it explains the responsiveness in demand in relation to changes in the income of the consumer.

Income elasticity of demand can be measured as follows:

$$\text{Income Elasticity of demand } (e_i) = \frac{\text{Percentage change in demand}}{\text{Percentage change in income}} = \frac{\%\ \Delta Q_d}{\%\ \Delta Y}$$

$$e_i = \frac{\text{Change in demand}}{\text{Original demand}} \Big/ \frac{\text{Change in income}}{\text{Original income}} = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta Y}{Y}} = \frac{\Delta Q}{Q} \times \frac{Y}{\Delta Y}$$

$$= \frac{\Delta Q}{\Delta Y} \cdot \frac{Y}{Q} \quad \text{(Point income elasticity of demand)} \qquad (2.9)$$

Where, Q stands for original demand

Y stands for original income

ΔQ stands for change in demand and ΔY stands for change in income

The following example will further clarify the concept of income elasticity of demand:

Example: Suppose a consumer has money income of Birr 1000 and he purchases 4 kg of wheat. If his money income goes up to Birr 1200, he is now prepared to buy 5 kg of wheat. His income elasticity of demand can be found as follows.

Solution: Given $Q_1 = 4$, $Q_2 = 5$, $Y_1 = 1000$, $Y_2 = 1{,}200$

$\Delta Q = Q_2 - Q_1 = 1$ $\quad$ $\Delta Y = Y_2 - Y_1 = 200$

$$e_i = \frac{\Delta Q}{\Delta Y} \times \frac{Y_1}{Q_1} = \frac{1}{200} \times \frac{1{,}000}{4} = 1.25$$

Note:

The income elasticity of demand in the case of normal goods is positive, but in the case of inferior goods, it is negative.

The arc income elasticity of demand can be calculated using similar formula for arc price elasticity of demand.

$$\text{Arc income elasticity of demand} \quad \frac{Q_2 - Q_1}{I_1 - I_2} \cdot \frac{I_1 + I_2}{Q_1 + Q_2}$$

Where: I_1 = initial income, Q_1 = initial quantity demanded

I_2 = the new income, Q_2 = the new quantity demanded

Example: Suppose a consumer started consuming 12 kg of butter when his income increased to Birr 2000 – which he used to consume only 8 kg when his income was Birr 1600. The consumer's income elasticity of demand can be found using arc method as follows.

Solution: Given: $Q_1 = 8$ kg, $I_1 = $ Birr 1600, $Q_2 = 12$ kg, $I_2 = $ Birr 2000, $e_i = ?$

$$e_i = \frac{Q_2 - Q_1}{I_2 - I_1} \cdot \frac{I_1 + I_2}{Q_1 + Q_2}$$

$$= \frac{12 - 8}{2000 - 1600} \cdot \frac{1600 + 2000}{8 + 12} = \frac{4}{400} \cdot \frac{3600}{20} = 1.8$$

Cross Elasticity of Demand

Responsiveness in the demand for a commodity to the changes in the prices of its related goods is called cross elasticity of demand. In other words cross elasticity of demand may be defined as the ratio of proportionate change in the demand of one commodity (say x) to the proportionate change in the price of another

© MoE FDR Ethiopia Not to be republished

commodity (say y). It can be measured as follows:

$$\text{Cross Elasticity of Demand } (e_{xy}) = \frac{\%\text{ change in demand for commodities x}}{\%\text{ change in price of commodities y}}$$

$$= \frac{\frac{\Delta Q_x}{Q_y}}{\frac{\Delta P_y}{P_y}} = \frac{Q_x}{Q_x} \times \frac{P_y}{P_y}$$

$$e_{xy} = \frac{\Delta Q_x}{\Delta P_x} \times \frac{P_y}{Q_y} \quad \text{(Point cross price of elasticity of demand)} \qquad (2.10)$$

Where, Q_x = Original quantity of commodity x.

Δ_x = Change in quantity of commodity x.

P_y = Original price of commodity y.

Δ_y = Change in price of commodity y.

The following example will further clarify the concept of cross elasticity of demand.

Example: Suppose the price of coffee rises from Birr 100 per kg to Birr 120 per kg. As a result, consumer demand for tea (being a good substitute for coffee) rises from 20 kg to 30 kg. Cross elasticity of demand for tea.

Solution: Given $Q_{x_1} = 20$, $Q_{x_2} = 30$, $P_{y_1} = 100$, $P_{y_2} = 120$, $\Delta_x = 10$, $\Delta_y = 20$,

$$e_{xy} = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

$$= \frac{10}{20} \times \frac{100}{20}$$

$$= \frac{5}{2} = 2.5$$

Thus, cross elasticity of demand for tea and coffee is 2.5. That is, if price of coffee increases by 1% demand for tea increases by 2.5%.

Note:

Cross elasticity of demand in the case of substitute goods (tea, coffee, oil, butter) will be positive because a change in the price of one commodity will change the demand for another commodity in the same direction, but in the case of complementary goods (car, petrol; pen, ink) it will be negative because change in the price of one commodity will cause a change in the demand for another commodity in the opposite direction.

© MoE-FDRE Ethiopia Not to be republished

Practical Work

1 Price per unit of a commodity increases from Birr 5 to Birr 6. As a result, the demand decreases from 100 units to 80 units. Calculate price elasticity of demand.

Solution: Given: $Q_1 = 100$, $Q_2 = 80$, $P_1 = 5$ and $P_2 = 6$

$\Delta Q = 100 - 80 = 20$

$e_P = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = 20\ (5/100) = 1$ (Point price elasticity of demand)

? Demand for the commodity is unit-elastic, that is, 1% increase in price causes 1% fall in quantity demand.

2 Demand for a commodity increased from 100 units to 120 units as a result of 10% fall in its price. Calculate price elasticity of demand.

Solution: Given: $Q_{x_1} = 100$, $Q_{x_2} = 30$, $Q_{x_2} = 120$, fall in price = 10%

$$e_P = \frac{\%\text{ change in quantity demanded}}{\%\text{ change in price}}$$

$$\%\text{ change in quantity demanded} = \frac{\text{change in quantity demanded}}{\text{change in quantity}} \times 100$$

$$= \frac{120 - 100}{100} \times 100 = 20\%$$

% change in price = 10%

? $|e_P| = \frac{20}{10} = 2$ (Point price elasticity of demand)

? Demand for the commodity is more than unit-elastic, that is, 1% fall in price cases 2% rise in quantity demanded.

3 On the basis of the given table, compare the price elasticities of two commodities X and Y.

	Commodity X		Commodity Y	
	Price	Quantity	Price	Quantity
Old	20	50	6	10
New	25	40	8	8

© MoE, FDR Ethiopia Not to be republished

Solution: In case of Commodity X:

$$|e_P| = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$$\frac{50 - 40}{25 - 20} \times \frac{20}{50} = \frac{10}{5} \times \frac{20}{50} = 0.8$$

In case of Commodity Y:

$$|e_P| = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$$\frac{10 - 8}{8 - 6} \times \frac{6}{10} = \frac{2}{2} \times \frac{6}{10} = 0.6$$ (Point price elasticity of demand)

∴ Demand for commodity X is more elastic.

4 At Birr 5 per unit, a consumer buys 40 units of a commodity and the price elasticity of his demand is 2. How much will he buy if the price reduces to Birr 4 per unit?

Solution: Given: $P_1 = 5$, $Q_1 = 40$, $e_p = 2$, $P_2 = 4$ and $Q_2 = ?$

$$e_p = \frac{\%\Delta Q}{\%\Delta P} \text{ or } \frac{P_1}{Q_1} \quad \left|\frac{Q_2 - Q_1}{4 - 5}\right| \times \frac{5}{40} \text{ or } 2 \quad \frac{Q_2 - 40}{1} \times \frac{40}{5}$$

$\therefore Q_2 - 40 = 16$

∴ New quantity (Q_2) = 16 + 40 = 56 units

The consumer will buy 56 units of the commodity, when its price reduce to Birr 4 per unit.

5 A consumers's weekly income rises from Birr 300 to Birr 320, and as a result his/her purchase of the good X increases from 25 units per week to 30 units. Calculate his income elasticity of demand.

Solution: Given: $Y_1 = 300$, $Y_2 = 320$, $Q_1 = 25$, $Q_2 = 30$

$\Delta Y = Y_2 - Y_1 = 20$, $\Delta Q = Q_2 - Q_1 = 5$

$$e_i = \frac{\Delta Q}{\Delta Y} \times \frac{Y_1}{Q_1} = \frac{5}{20} \times \frac{300}{25} = 3$$ (Point income elasticity of demand)

© MoE-EDRI Ethiopia Not to be republished

6 Assume that the price of coffee rises from Birr 4.5 per 100 gm to Birr 5 per 100 gm and, as a result, the consumer demand for tea increases from 60 per hundred gm to 70 gram per hundred gm. Calculate the cross elasticity of demand of tea for coffee.

Solution: Given: $Q_{x_1} = 60$, $Q_{x_2} = 70$, $P_{y_1} = 4.5$, $P_{y_2} = 5$

$Q_x = Q_{x_2} - Q_{x_1} = 10$, $\Delta P_y = P_{y_2} - P_{y_1} = 0.5$

$$? \; e_{xy} = \frac{Q_x}{P_y} \times \frac{P_{y_1}}{Q_{x_1}} = \frac{10}{0.5} \times \frac{4.5}{60} = 1.5$$

(point cross price elasticity of demand)

Activity 2.4

1 Draw a linear demand curve and mark the different ranges of price elasticity of demand on it.

2 On chart paper, prepare a demonstration of mathematical formulae to compute the following:
   - a % change in quantity demanded
   - b Price elasticity of demand
   - c Income elasticity of demand
   - d Cross-price elasticity of demand

3 How do you illustrate price elasticiyt of demand using your personal experisence to price changes of goods you frequently consume?

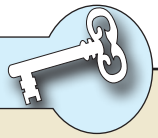
4 Outline the determinants of price ealsticity of demand and discuss how they affect level of consumption.

2.5 ELASTICITY OF SUPPLY

At the end of this section, you will be able to:

- explain the concept of elasticity of supply; and
- drive the formula and construct the graph of price elasticity of supply.

Key Terms and Concepts



- Elasticity of supply
- Inelastic supply
- Price elasticity of supply
- Unit elastic of supply
- Perfectly elastic supply

Start up Activity

Discuss on when and how sellers react to a change in price in the market in your local area.

Price Elasticity of Supply

Price elasticity of supply to change in price indicates how sellers react to change in price. The greater the reaction, the greater will be the elasticity, lesser the reaction, the smaller will be the elasticity.

For example, if the price of wheat rises, the farmers may be tempted to sell more in the market, and keep less for themselves. On the other hand, if the price of cars rises, the car manufacturers may not probably be in a position to offer more cars for sale, because they may not be keeping stock of cars.

$$\text{Price Elasticity of Supply } (e_s) = \frac{\text{\% change in quantity supplied}}{\text{\% change in price}} = \frac{\%\ Q_s}{\%\ P} \quad (2.11)$$

Determinants of Price Elasticity of Supply

There are many factors which determine the price elasticity of supply. The main factors are:

- **Behaviour of cost of production:** Elasticity of supply depends upon change in the cost of producing additional quantity of output. If an increase in output by the firms in an industry causes only a slight increase in their cost per unit or leads to a decrease in cost per unit, we would expect supply to be fairly elastic. If, on the other hand, an increase in supply leads to a large increase in cost of production, the supply would be relatively inelastic.
- **Time element:** A price change due to change in demand for a commodity may have a small response in the quantity supplied in the short-run since the production capacity may be limited. Therefore, in the short-run, supply tends to be relatively inelastic. However, in the long-run, new plants can be set up and production capacity can be expanded. Therefore, in the long-run supply tends to be elastic.
- **Nature of the commodity:** Nature of the commodity is also an important determinant of the elasticity of supply. For instance, the supply of durable products is relatively elastic. Durable goods can be stored and

hence producers can meet the market demand by running down their stocks. Therefore, supply of such goods can be increased or decreased quickly in response to change in price. On the other hand, supply of perishable goods like milk and vegetables is relatively less elastic.

- Availability of facilities for expanding output: The response of producers to changes in price depends on the availability of production facilities. If producers have sufficient production facilities, such as availability of raw materials, power, etc. they would be able to increase their supply in response to rises in prices of the commodities. The supply, therefore, will be elastic. But if, on the other hand, there is shortage of power, fuel and essential raw materials, the output would expand slowly in response to rises in prices of the commodities.
- Nature of inputs: Elasticity of supply depends on the nature of inputs used for the production of a commodity. If the production of a product requires inputs that are easily available, its supply would be more elastic. On the other hand, if it uses specialised inputs, its supply will be relatively inelastic.
- Risk-taking: The elasticity of supply is determined by the willingness of the entrepreneurs to take risk. If entrepreneurs are willing to take risk, the supply will be more elastic. On the other hand, if entrepreneurs hesitate to take risks, the supply will be inelastic.
- Expectation of future pricesIf the producers expect a rise in the price of a commodity in future, producers will like to hoard the commodity to take advantage of rise in future price. The supply will, therefore, be less elastic. On the other hand, if they expect a fall in future price, they will release the goods from their stocks. The supply will be more elastic.

Measurement of Price Elasticity of Supply

As the case with price elasticity of demand, we can measure the price elasticity of supply using different methods. However, a simple and most commonly used method is point method.

Point Method:The point method of measuring the price elasticity of supply is based on the definition of elasticity, that is, the ratio of proportionate change in quantity supplied of a commodity to a given proportionate change in its price. Thus, the formula for measuring price elasticity of supply is:

$$e_s = \frac{\frac{'Q}{Q} \times 100}{\frac{'P}{P} \times 100}$$

$$= \frac{Q}{Q} \quad \frac{P}{P} = \frac{'Q}{'P} \times \frac{P}{Q} \quad \text{(point price elasticity of supply)} \quad (2.12)$$

Where, e_s stands for elasticity of supply

Q stands for initial quantity

¨ 4 V W D Q G V I R U F K D Q J H L Q T X D Q W L W \ V X

P stands for initial price

ûP stands for change in price

Let us use this formula to calculate price elasticity of supply by taking examples.

Example 1: Suppose an increase in price of a ball pen from Birr 4 to Birr 5 results in increase in quantity supplied of pens from 1,000 to 1,500 units. Then find price elasticity of supply using the Arc method.

Solution: Given: $Q_1 = 1000$, $Q_2 = 1500$, $P_1 = 4$, $P_2 = 5$

4 ± û û 3 ±

$$? e_s = \frac{'Q}{'P} \quad \frac{P}{Q} = \frac{500}{1} \times \frac{4}{1000} = 2 \quad \text{(point price elasticity of supply)}$$

If price increases by 1%, quantity supplied increases by 2%.

Price elasticity of supply can also be calculated using arc price elasticity fo supply formula.

$$\text{Arc price elasticity of supply} = \frac{Q_2 \quad Q_1}{P_2 \quad P_1} \quad \frac{P_2 \quad P_1}{Q_1 \quad Q_2}$$

where P_1 is the initial price, Q_1 is the initial quantity supplied,

P_2 is the new price, Q_2 is the new quantity supplied

Example 2: A local producer of edible oil reduced its quantity supplied from 10,000 liters to 8,000 liters per month in response to price fall of oil from Birr 25 to Birr 20. Then find price elasticity of supply using the Arc method.

Solution: Price elasticity of supply using arc method can be found as follows.

Given: $P_1 = 25$, $Q_1 = 10{,}000$, $P_2 = 20$, $Q_2 = 8{,}000$

© MoE-EDRI Ethiopia Not to be republished

$$e_s = \frac{\frac{Q_2 - Q_1}{P_2 - P_1}}{\frac{P_2 - P_1}{Q_1 - Q_2}}$$

$$\frac{\frac{8,000 - 10,000}{20 - 25}}{\frac{25 - 20}{10,000 - 8,000}} \qquad \frac{\frac{2,000}{5}}{\frac{45}{18,000}}$$

1

Note that price elasticity of supply is always a positive number varying between 0 and ' . Also, it does not depend on the units of measurements of either quantity or price. It is a unit free measure.

Types of Elasticity of Supply

Elasticity of supply is generally classified into following five categories:

i Perfectly inelastic supply ($e_s = 0$): When quantity supplied does not change at all irrespective of any change in price of the commodity, it is said to be perfectly inelastic supply. Here elasticity of supply = 0 (Zero).

Price (Birr per kg)	Supply (kg)
10	50
20	50
30	50

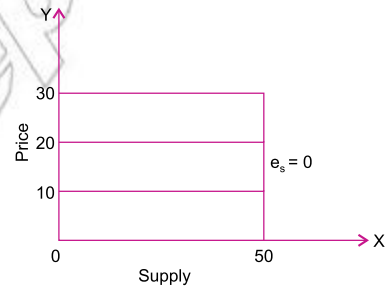


Figure 2.39: Perfectly in elastic supply

ii Less than unit elastic supply ($e_s < 1$): When percentage change in quantity supplied is less than the percentage change in price, it is said to be less than unit elastic supply. Here elasticity of supply is less than 1.

Price (Birr per kg)	Supply (kg)
10	50
20	60

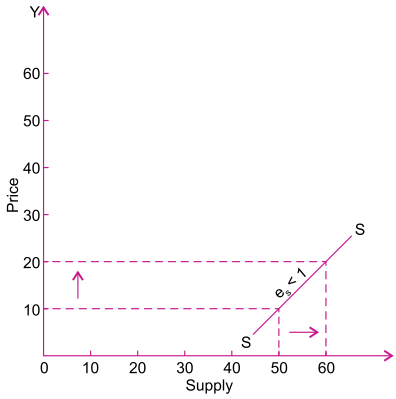


Figure 2.40: Less than unit elasitc supply

iii Unit elastic supply (e_s = 1): When percentage change in quantity supplied and percentage change in price are equal, it is said to be unit elastic supply. Here elasticity of supply is equal to 1.

Price (Birr per kg)	Supply (kg)
10	50
20	100

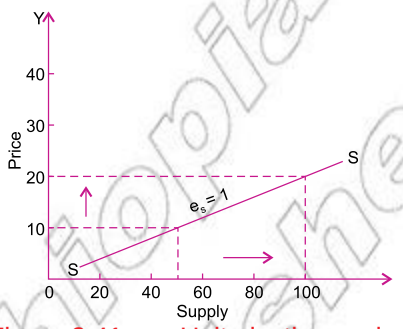


Figure 2.41: Unit elastic supply

iv More than unit elastic supply (e_s > 1): When percentage change in quantity supplied is more than percentage change in price, it is said to be more than unit elastic supply. Here elasticity of supply is more than 1.

Price (Birr per kg)	Supply (kg)
10	50
20	150

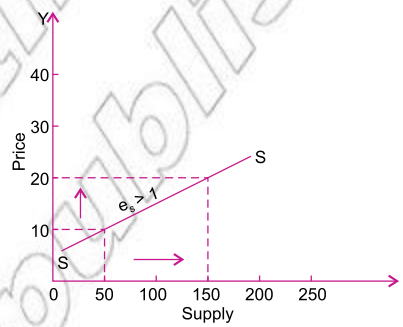


Figure 2.42: More than unit elastic supply

v Perfectly elastic supply (e_s ’ When supply of a commodity rises or falls to any extent without or with very little change in price, the supply of the commodity is said to be perfectly elastic or infinitely elastic supply. Here elasticity of supply = ’ (infinity).

Price (Birr per kg)	Supply (kg)
20	100
20	300

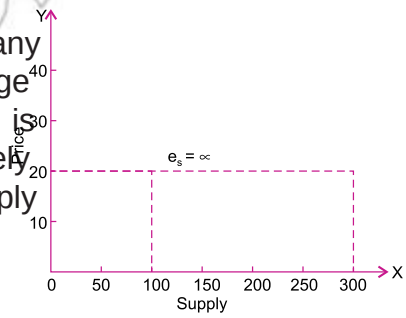


Figure 2.43: Perfectly elastic supply

Table 2.9: Types of Price Elasticities of Demand

Value of Elasticity of Supply	Types of Price Elasticity of Supply	Description
es = 0	Perfectly Inelastic	Change in price does not affect supply at all
es < 1	Less than Unit Elastic (inelastic)	% change in supply is less than % change in price
es = 1	Unit Elastic	% change in supply is equal to % change in price
es > 1	More than Unit Elastic (elastic)	% change in supply is more than % change in price
es = ’	Perfectly Elastic	Supply changes infinitely

Practical Work

1 If price of a commodity falls from Birr 60 per unit to Birr 58 per unit, its supply decreases from 400 to 300 units. Find out its elasticity of supply.

Solution: Given: $P_1 = 60$, $P_2 = 58$, $Q_1 = 400$, $Q_2 = 300$

$\Delta P = 58 - 60 = -2$

$\Delta Q = 400 - 300 = 100$

$$\therefore e_s = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{100}{2} \times \frac{60}{400} = 7.5$$

∴ Supply of the commodity is highly elastic.

2 The coefficient of elasticity of supply of a commodity is 3. A seller supplies 20 units of this commodity at a price of Birr 8 per unit. How much of this commodity will the seller supply when price rises by Birr 2 per unit?

Solution: Given: $e_s = 3$, $P_1 = 8$, $\Delta P = 2$, $Q_1 = 20$, $Q_2 = ?$

We know that,

∴ The supplier will supply 35 units at the commodity at 10 Birr per unit.

3 The quantity supplied of a commodity at a price of Birr 8 per unit is 400 units. Its price elasticity of supply is 2. Calculate the price at which its quantity supplied is 600 units.

Solution: Given: $e_s = 2$, $P_1 = 8$, $Q_1 = 400$, $Q_2 = 600$,

$\Delta Q = 600 - 400 = 200$ $\Delta P = P_2 - 8$

We know that,

$\therefore 2P_2 - 16 = 4 \therefore 2P_2 = 20 \therefore P_2 = 10$

∴ The quantity supplied will be 600 units at a price of 10 Birr per unit.

© MoE-FDRE Ethiopia Not to be republished

4 When the price of a commodity falls from Birr 10 per unit to Birr 9 per unit, its quantity supplied falls by 20%. Calculate its price elasticity of supply.

Solution: Given: $P_1 = 10$, P_2 = 9, e_s = 2

$$e_s = \frac{\text{change in quantity supplied}}{\text{change in price}} \times 100$$

% change in quantity supplied = 20%

$$\% \text{ change in price} = \frac{\text{change in Price}}{\text{original Price}} \times 100$$

$$= \frac{(10 - 9)}{10} \times 100 = 10\% \quad \therefore e_s = \frac{20\%}{10\%} = 2$$

5 Calculate price elasticity of supply from the following data:

Price (Birr)	Total Revenue (Birr)
8	224
12	504

Solution: We know that

Total revenue = Price × Quantity

$$\therefore \text{Quantity} = \frac{\text{Total Revenue}}{\text{Price}}$$

We calculate the units of quantity supplied for the given data, as follows:

Price (Birr)	Total Revenue (Birr)	Quantity (Units)
8	224	28
12	504	42

Given: $P_1 = 8$, $P_2 = 12$,

$Qs_1 = 28$, $Qs_2 = 42$

$$e_s = \frac{S}{P} \times \frac{P}{S}$$

$$= \frac{42-28}{12-8} \times \frac{8}{28} = 1$$

© MoE-FDRE Ethiopia Not to be republished

Activity 2.5

1 From the following supply schedule, calculate price elasticity of supply if the price falls from Birr 5 per unit to Birr 3 per unit.

Price per unit (Birr)	Quantity per unit of time (kg)
6	6000
5	5500
4	4500
3	3000
2	0

2 The coefficient of elasticity of supply of a commodity A is 3. What quantity of the commodity will a seller supply at the price of Birr 4 per unit if he supplies 30 units at Birr 3 per unit?

3 If price of a commodity falls from Birr 60 per unit to Birr 58 per unit, its supply expands from 300 to 400 units. Find out its elasticity of supply.

4 The coefficient of elasticity of supply of a commodity is 2. A seller supplies 20 units of this commodity at a price of Birr 10 per unit. What quantity of this commodity will the seller supply when price rises by Birr 12 per unit?

© MoE, FDRE
Not to be re

UNIT SUMMARY

- Demand for a commodity refers to the amount that will be purchased at a particular price during a particular period of time.
- Individual demand for a commodity is the amount purchased by a single consumer at a given price during a particular period of time.
- Market demand refers to the total quantity of a commodity that all households are prepared to buy at a given price during a specified period of time.
- Determinants of demand are the factors affecting the demand for a commodity. Important determinants of demand are:
  - price of the commodity,
  - income of the consumer,
  - prices of related goods,
  - consumers tastes and preferences,
  - consumers expectations,
  - consumer-credit facility,
  - size and composition of population,
  - distribution of income,
  - government policy.
- A normal good is a good for which the demand increases with increases in income.
- An inferior good is a good for which the demand tends to fall with an increase in the income of the consumer.
- Substitute goods are those goods which satisfy the same type of demand and can be used in place of one another.
- Complementary goods are those goods which are used jointly or together.
- Giffen goods are those inferior goods on which the consumer spends a large part of his income and whose demand falls with a fall in their prices.
- When the price of a good rises, the demand for it generally falls.
- When income rises, demand for a normal good rises but demand for an inferior good falls; demand for necessities is independent of the level of income, beyond a particular level of income.
- There is a direct relationship between the demand for a good and the price of its substitute.
- There is an inverse relationship between the demand for a good and the price of its complement.

- The law of demand states that, other things remaining equal, the quantity demanded of a commodity increases when its price falls and decreases when the price rises. The law can be illustrated with the help of a demand schedule a demand curve, and a demand function.
- A demand schedule is a table that shows different quantities of a commodity that would be demanded at different prices.
- A market demand schedule of a good is the sum of demand schedules of individual consumers.
- A demand curve is the graphical representation of a demand schedule.
- The negatively slope of demand curves or the law of demand showing the inverse relationship between price and the amount purchased is due to:
  - diminishing marginal utility,
  - income effect,
  - substitution effect,
  - increase in number of consumers,
  - several uses of a commodity.
- Income effect refers to change in demand on account of change in real income resulting from a change in the price of a commodity. A fall in price results in an increase in real income and vice-versa.
- Substitution effect is the effect that a change in relative prices of substitute goods has on the quantity demanded.
- Exceptions to the law of demand are:
  - Giffen goods,
  - Prestige goods,
  - Expectations about future prices,
  - necessities, and
  - emergencies.
- Changes in demand due to the changes in the price of the commodity itself are known as change in quantity demanded , whereas changes due to change in factors other than price are called change in demand .
- Supply of a commodity refers to the quantity of a commodity which producers are willing to produce and offer for sale at a particular price during a particular period of time.
- Individual supply refers to a quantity of a commodity which one firm is willing to produce and offer for sale at a particular price during a specified period.
- Market or Industry's supply is the quantity that all the producers are willing to produce and offer for sale at a particular price during a specified period.

- Determinants of supply are:
  - Price of a commodity,
  - Goals of the firm,
  - Input prices,
  - Prices of related products,
  - Techniques of production,
  - Nature of the commodity,
  - The policy of taxation and subsidy,
  - Expectations of future prices,
  - Natural factors.
- Law of supply states that other things remaining the same, the quantity of any commodity that firms will produce and offer for sale rises with a rise in price and falls with a fall in price.
- Supply schedule is a tabular statement showing various quantities which producers are willing to produce and sell at various prices during a given period, it is of two types:
- Individual supply curve,
- Market supply curve. A supply curve is normally positively sloping.
- Changes in supply due to the change in the price of the commodity itself are known as change in quantity supplied , whereas changes due to change in factors other than price are called change in supply .
- Market equilibrium refers to a situation in which quantity demanded of a commodity equals the quantity supplied of a commodity.
- Equilibrium price is the price at which quantity demanded equals quantity supplied. At any other price, demand and supply are not equal.
- Equilibrium quantity refers to the amount that is bought and sold at equilibrium price.
- Diagrammatically, equilibrium price is determined at the point of intersection of demand curve with supply curve.
- An increase in demand for a commodity causes an increase in both the equilibrium price and equilibrium quantity.
- A decrease in demand for a commodity causes a decrease in both, the equilibrium price and equilibrium quantity.
- An increase in supply of a commodity causes a decrease in the equilibrium price and increase in equilibrium quantity.
- A decrease in supply of a commodity causes an increase in equilibrium price and a decrease in the equilibrium quantity.
- A simultaneous increase in demand and supply of a commodity will result in no change in price, increase in price or decrease in price depending upon whether increase in demand is equal to, greater than or smaller than the increase in supply.

- Elasticity of demand refers to the degree of responsiveness of quantity demanded of a commodity to change in any of its determinants.
- Price elasticity of demand measures the ratio of percentage change in the quantity demanded of a commodity to a given percentage change in its price. The numerical value of price elasticity of demand ranges from zero to infinity.
- Degree of price elasticity of demand is expressed in terms of five types:
  - zero elasticity,
  - infinite elasticity,
  - unitary elasticity,
  - greater than unity elasticity,
  - less than unity elasticity.
- Point elasticity of demand measures elasticity at a point on the demand curve.
- Arc elasticity of demand measures elasticity over a finite range or arc of the demand curve.
- Three methods of measuring price elasticity of demand are:
  - Percentage method,
  - Total expenditure method,
  - Geometric method or Point method.
- Percentage method or Proportionate method measures the elasticity by dividing the percentage change in demand by percentage change in price. Symbolically,

$$e_p = \frac{'Q}{'P} \; u \; \frac{P}{Q}$$

- Total expenditure method measures the price elasticity of demand by considering change in the total expenditure as a result of change in the price of the commodity. If total expenditure remains unchanged with change in price, elasticity is equal to unity; if total expenditure change inversely with change in price, elasticity is greater than unity; if total expenditure changes directly with change in price, elasticity is less than unity.
- Geometric method measures elasticity by taking the ratio of line segment below the point on the demand curve to the line segment above the point.
- Determinants of price elasticity of demand are:
  - availability of substitutes,
  - nature of the commodity,
  - proportion of income spent,
  - the number of uses of a commodity,
  - time factor,
  - postponement of consumption,

- price range,
- habits of the consumer.

- Income elasticity measures the responsiveness of demand for a commodity to a change in the income of the consumer. Income elasticity of demand is positive in case of normal goods and negative in case of inferior goods.
- Cross elasticity measures the responsiveness of demand for a commodity to a change in the price of the related commodity. Cross elasticity is positive in case of substitute goods and negative in case of complementary goods.
- Price elasticity of supply measures the degree of responsiveness of the quantity supplied of a commodity to a change in its price.
- Measurement of elasticity of supply :

$$e_s = \frac{'Q}{'P} \; u \; \frac{P}{Q}$$

- Determinants of elasticity of supply are:
  - Cost of production,
  - Time factor,
  - Nature of the commodity,
  - Availability of facilities for expanding output,
  - Nature of inputs,
  - Risk taking,
  - Expectations of future prices.

REVIEW EXERCISE FOR UNIT 2

I Distinguish between the following:

1 Income demand and price demand
2 Normal goods and inferior goods
3 Direct demand and derived demand
4 Complementary goods and substitute goods
5 Market demand and individual demand
6 Change in demand and change in quantity demanded
7 Individual supply and market supply
8 Change in supply and change in quantity supplied
9 Excess demand and excess supply
10 Price ceiling and price floor.

II Match the items in column A with those in column B

	Column A		Column B
11	More demand at lower price	A	Increase in demand
12	Less demand at higher price	B	Decrease in demand
13	More demand at the same price	C	Extension of demand
14	Same demand at lower price	D	Downward movement along the same demand curve
15	Extension of demand	E	Contraction of demand
16	Increase in demand	F	Upward movement along the same demand curve
17	Contraction of demand	G	Leftward shift in the demand curve
18	Decrease in demand	H	Rightward shift in the demand curve
19	More supply at same price	I	Decrease in supply
20	Same supply at higher price	J	Increase in supply

III Write 'True' or 'False' for each of the following:

21 A change in price of coffee may affect the demand for tea.

22 A change in price of wheat may affect the supply of petrol.

23 The demand for sugar may increase due to an increase in population.

24 A decrease in supply refers to a rightward shift in supply curve.

25 The only factor that can cause a change in quantity demanded is the price of the commodity.

26 Giffen goods are a special category of inferior goods.

27 A rise in the price of normal goods leads to a fall in quantity demanded.

28 A change in income causes a change in quantity demanded.

29 An increase in demand leads to a fall in equilibrium price.

30 Price ceiling causes surplus.

IV In case of each of the following, four choices are given but only one out of them is correct. Choose the correct one.

31 Demand reflects the quantity that consumers:

A want at alternative prices.

B need at alternative prices.

C are willing and able to buy at alternative prices.

D can buy at alternative prices.

32 A price change:

A affects the consumer's ability to buy the good.

B affects the consumer's willingness to buy the good.

C changes the tastes of consumers.

D all of the above.

33 Which one of the following is not held constant in defining the demand schedule?

A income

B prices of related goods

C prices of the good in question

D number of consumers

34 A movement along a demand curve can be caused by a change in:

A income

B the price of a substitute or complement

C expectation about future prices

D the price of the good in question

35 If a supply curve is a vertical straight line, the value of elasticity of supply (E_s) is:

A ' B >1 C <1 D 0

V Write very short answers to the following

36 Give an example of a substitute good.

37 What happens to the demand for substitute goods of a commodity when the price of the commodity falls?

38 What will be the effect on the demand for tea if the price of coffee rises?

39 Give two examples of complementary goods.

40 What will be the effect on the demand for ink if the price for pens falls?

41 What do you understand by unrelated goods.

42 If the demand for good Y increases as the price of another good X rises, how are the two goods related?

43 If the quantity demanded of commodity X decreases as the household's income increases, what type of good is X?

44 If the demand for good Y decreases as the price of another good, X, falls, how are the two goods related?

45 If the demand for good Y increases as the price of another good X falls, how are the two goods related?

46 If the demand for good Y decreases as the price of another good, X, rises, how are the two goods related?

47 How does a favourable change in tastes affect the demand and demand curve for a commodity?

48 How would you obtain a market demand curve from given individual demand curves?

49 If demand becomes zero with a slight rise in the price, what would you call such a demand?

50 When the proportionate (or percentage) change in quantity demanded is more than the proportionate (or percentage) change in price, what is the elasticity of demand?

51 What will be the elasticity of supply if the change in quantity supplied is exactly in proportion to the change in price?

52 Draw a unitary elastic supply curve.

53 When is the market said to be in a state of equilibrium?

54 If nothing is supplied, even at a marginally reduced price, what will be the elasticity of supply?

55 When supply remains unchanged, what is the effect of change in demand on price?

56 Suppose the market demand function for good X is given by $Q_x = 30 - 2P$, and the supply function for good X is given by $Q_x = -6 + P$. Then, calculate the:

a market clearing price and quantity respectively.

b price and supply elasticity of demand.

3

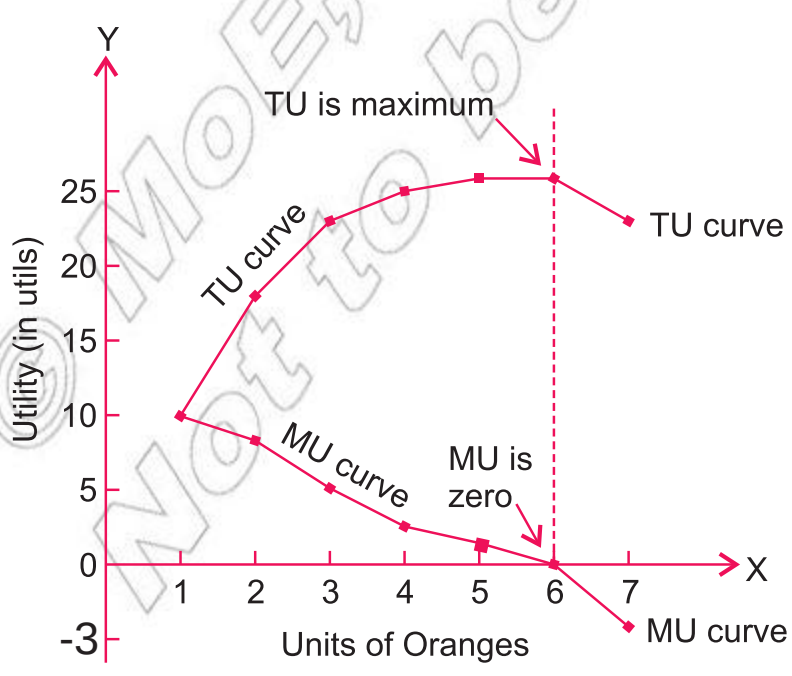
Unit Objectives

After completing this unit, you will be able to:

- analyze the different theories of consumer choice and behaviour.

Main Contents

3.1 THE CONCEPT OF UTILITY
3.2 THE CARDINAL UTILITY THEORY
3.3 THE ORDINAL UTILITY THEORY: INDIFFERENCE CURVE APPROACH
- Unit Summary
- Review Exercise



© MoE Not to be

INTRODUCTION

In the previous unit we have learnt about the law of demand. It tells us that a consumer buys more of a commodity when its price falls and vice-versa. The question now is why does he or she do so? Not only that, the basic question is why does a consumer buy a commodity? or how does a consumer decide about the purchase of a commodity, its quantity at a given price, etc.? In short, we may say, our question is what regulates consumer behaviour in the market? Economists have developed various theories to explain consumer behaviour, and that is the subject matter of our present unit.

We begin this unit with the notion of utility, which gives a basic explanation of consumer behaviour, discusses various theories of consumer behaviour, and examines how consumer's behaviour is affected by a change in his income or the price of the commodity.

3.1 THE CONCEPT OF UTILITY

At the end of this section, you will be able to:

- define the concept of utility and total marginal utility;
- state the law of diminishing marginal utility;
- classify the theories of utility.

Key Terms and Concepts

- Utility
- Total utility
- Marginal utility

Start-up Activity

Why is it essential to buy commodities and services?

The notion of utility gives us a basic explanation of consumer behaviour. Before we discuss the concept of utility, let us note some assumptions that we make about an average consumer.

The consumer is assumed to be rational. Given his income and the market prices of the various commodities, he/she plans the spending of his/her income so as to attain the highest possible satisfaction or utility. It is assumed that the consumer has full knowledge of all the information relevant to his/her decision, that is, he/she has complete knowledge of all the available commodities, their prices and

his/her income. In order to attain this objective, the consumer must be able to compare the utility (satisfaction) of the various 'baskets of goods' which he/she can buy with his/her income.

Utility

Why do we purchase commodities or services? Obviously, the answer would be that consumption of these commodities and services gives us satisfaction. The satisfaction which a consumer gets by having or consuming goods or services is called utility. The same commodity gives different utilities to different consumers. Even for the same consumer, utility varies from unit to unit, from time to time and from place to place.

Measurement of Utility

Conceptually, we measure utility in units called utils. Since utils are not well-defined, it is, in fact, not possible to measure utility in terms of these units. Yet we discuss them because this helps us to understand the consumer's behaviour. It is useful, analytically, to distinguish between the two utility concepts:

i total utility, and

ii marginal utility.

I Total Utility

The total utility refers to the sum total of satisfaction which a consumer receives by consuming the various units of the commodity. The more units of a commodity she/he consumes, the greater will be her/his total utility or satisfaction from it, up to a certain point. As he/she keeps on increasing the consumption of the commodity, he/she eventually reaches the point of saturation represented by maximum total utility. If further units of the commodity are consumed, her/his total utility starts declining.

II Marginal Utility

The marginal utility of a good is defined as the change in total utility resulting from one unit change in the consumption of the good, i.e.,

$$MU_x = \frac{TU_x}{Q_x} \qquad (3.1)$$

Where, MU= Marginal utility,

û 7 8 & K D Q J H L Q W R W D O X W L O L W \

û 4= change in quantity of good X consumed

Relationship between Total Utility and Marginal Utility

The relation between total utility and marginal utility can be easily discussed with the help of the following table.

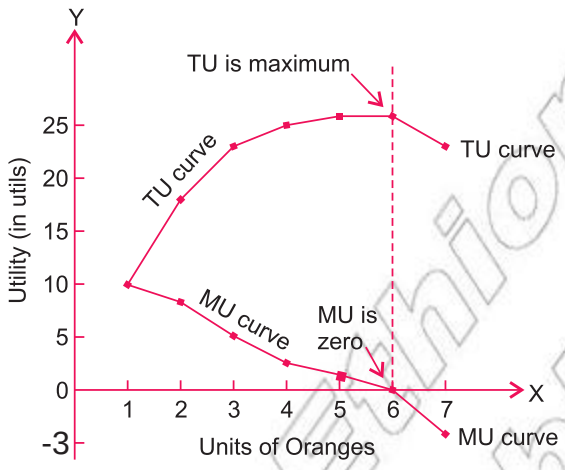
Table 3.1: Marginal Utility and Total Utility

Units of Oranges Consumed	Marginal Utility (utils)	Total Utility (utils)
0	–	0
1	10	10
2	8	18
3	5	23
4	2	25
5	1	26
6	0	26
7	–3	23

If a consumer consumes only one orange, the first unit is the marginal unit, so the marginal utility as well as total utility is 10 utils. If she/he consumes 2 oranges, the second orange is the additional unit and utility from it is marginal utility which is 8 utils. The total utility from 2 oranges is now 18 utils (10 from first orange + 8 from second orange). In this way total utility can be calculated from consuming 3, 4 or 5 oranges. We may say total utility is the sum of marginal utilities of various units of a commodity.

Total Utility = Sum of all Marginal Utilities (3. 2)

Table 3.1can be represented graphically in the form of TU and MU curves, as follows.



Where,TU = Total utility and MU = Marginal utility.

Figure 3.1: Relationship between total utility and marginal utility

A study of Table 3.1 and Figure 3.1 indicates the following relationship between Total Utility (TU) and Marginal Utility (MU).

- TU increases as long as marginal utility is positive .
- TU is maximum when MU is zero.
- TU starts declining when MU becomes negative.

Activity 3.1

1 Can the level of satisfaction obtained by consuming the same product by different individuals be different? Think about the consumption of different goods by different people known to you, and try to obtain a rational answer to the above question.

2 What happens to total utility if a consumer consumes a commodity beyond that level when its marginal utility becomes zero?

3 Ms. Hiwot is a managerial economist by profession and believes in the validity of economic laws. After a long wait she finally found the time to go to a movie — a pastime she cherishes. In the 15 minute interval time she walked out of the hall and sat down on the sofa placed in a restaurant in the theatre lobby. She happened to glance at the price list displayed at the side of the restaurant and found that a cup of coffee was available for Birr 10. Being an economist in every thought and action she immediately calculated that to her the satisfaction

expected from the cup of coffee was not higher than the satisfaction she could derive by spending Birr 10 on some alternative purchase. She decided not to buy the cup of coffee.

Then to her surprise, she noticed that the cup of coffee was accompanied by a pair of biscuits (at no extra cost). She ordered a cup of coffee. Think about the above case problem, discuss it with your friends, and try to find the rationale behind the evaluation of the choice made by Ms Hiwot.

4 Discuss and try to find out if the total utility derived from the consumption of a certain unit of a commodity can ever be zero or negative.

3.2 THE CARDINAL UTILITY THEORY

At the end of this section, you will be able to:

- describe the cardinal utility theory; and
- examine how the cardinalists maximize their total utility and compute and interpret the algebrical restatement.

Key Terms and Concepts

- Cardinal utility
- Law of diminishing marginal utility
- Consumer's equilibrium

Start-up Activity

Assume you are thirsty and need three glasses of water to satisfy.

Which glass of water do you think yields more satisfaction to you? The first, the second or the third? What would happen if you continue drinking the 4th, 5th, 6th - glass of water to your satisfaction?

Economists have developed various theories to explain consumer behaviour, particularly a consumer's equilibrium, in respect to his/her purchase of different commodities. A consumer will be in equilibrium when he/she spends his/her given income on the purchase of different goods in such a way so as to maximise his/her total utility.

In this section we discuss how cardinal utility theory explains the consumer behaviour based on the concepts of total and marginal utility. This theory has been given by traditional economists and it makes the following assumptions.

Assumptions

- Rationality - The consumer is rational. She/he aims at the maximisation of her/his utility, subject to the constraints imposed by her/his given income.
- Cardinal utility: The utility of each commodity is measurable. Utility is a cardinal concept.
- Constant Marginal Utility of Money: This assumption is necessary if the monetary unit is used as the measure of utility. The essential feature of a standard unit of measurement is that it is constant.
- Diminishing Marginal Utility: The utility gained from the successive units of a commodity diminishes. In other words, the marginal utility of a commodity diminishes as the consumer consumes larger quantities of it. This is the axiom of diminishing marginal utility.

The Law of Diminishing Marginal Utility

This is the basic hypothesis of cardinal utility theory. According to the law of diminishing marginal utility, "for any individual consumer the value that she/he attaches to successive units of a particular commodity will diminish steadily as her/his total consumption of that commodity increases, the consumption of all other goods being held constant" (R.G. Lipsey).

The law can also be stated in a simple language as follows: As the amount of a commodity increases, the utility derived by the consumer from the additional units, that is, marginal utility, goes on decreasing.

In other words, as the consumer consumes more, her/his total utility will increase but at a decreasing rate. It is a natural fact that when a consumer consumes additional units of a particular good at a point of time, her/his desire for every successive unit become less intense, consequently utility derived from each successive unit diminishes. We can use Table 3.1 and Figure 3.1 to explain the law.

Table 3.1 presents a numerical illustration of the law. It clearly shows that as the consumption of oranges is increased, the total utility increases but at a diminishing rate. It means that marginal utility decreases with increase in consumption. This is shown in the second column of the table.

The law is graphically illustrated in Figure 3.1. TU curve, which is concave from above, and the negatively sloping MU curve illustrates that as the consumer consumes more and more units of a commodity, the marginal utility from each successive unit goes on decreasing.

Assumptions of the Law of Diminishing Marginal Utility

- Various units of the good are homogeneous,
- There is no time gap between consumption of the different units,
- Consumer is rational (that is, she/he has complete knowledge and maximises utility),
- Tastes, preferences and fashions remain unchanged.

Consumer's Equilibrium or Law of Equi-Marginal Utility

How should a consumer spend his/her income money on different commodities? How much of different commodities should be purchased by the consumer? Or, how should a consumer allocate his/her given income money among different commodities?

To answer all these questions, economists have developed the concept of consumer's equilibrium and the law of equi-marginal utility.

As already stated, a consumer will be in equilibrium when she/he spends her/his given income on the purchase of different commodities in such a way so as to maximise her/his total utility. This is sometimes also referred as Utility Maximizing Rule.

Assumptions

The concept of consumer's equilibrium is based on the following assumptions:

- The consumer is rational. She/he aims the maximisation of her/his utility or satisfaction,
- Cardinal measurement of utility is possible,
- If utility is measured in terms of money, marginal utility of money remains constant,
- The law of diminishing marginal utility operates,
- Consumer's income is given and remains constant,
- Prices of commodities are given and remain constant.

Explanation

Suppose a consumer wants to purchase many commodities from his/her given income. The fundamental condition of consumer's equilibrium is the law of

equi-marginal utility. The law of equi-marginal utility states that a consumer gets maximum satisfaction when the ratio of marginal utilities of all commodities and their prices is equal. In other words, the consumer should incur expenditure on different commodities in such a manner that the marginal utility of the last Birr spent on each one of them is equal

Thus, in the situation of consumer's equilibrium the utility derived from spending an additional unit of money must be the same for all commodities. If the consumer derives greater utility from any one commodity, she/he can increase her/his satisfaction by spending more on that commodity and less on the others. It will continue till the above equilibrium condition is reached.

Mathematically, the conditions of equilibrium are as follows.

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \frac{MU_n}{P_n} \qquad (3.3)$$

Where, MU_x = Marginal utility of commodity x;
MU_y = Marginal utility of commodity y;
MU_n = Marginal utility of commodity n
P_x = Price of x
P_y = Price of y
P_n = Price of n

Expenditure on x + Expenditure on y + ... + Expenditure on n = Consumer's Income

or

$$P_x \times Q_x + P_y \times Q_x + \ldots + P_n \times Q_n = I \qquad (3.4)$$

Where, Q_x, Q_y and Q_n are quantities of commodities x, y and n, respectively and I = consumer's income.

An Illustration

Suppose there are two commodities x and y. P_x = Birr 4 per unit; P_y = Birr 2 per unit; consumer's money income = Birr 30. Marginal utilities of x and y are given in Table 3.2 below.

© MoE-EIDR Ethiopia Not to be republished

Table 3.2:

Unit	MU_x	MU_y
1	80	40
2	72	38
3	64	36
4	56	34
5	48	32
6	40	30
7	32	28
8	24	26
9	16	54
10	8	22

Let us see how the consumer should allocate his income between x and y. Or, what respective quantities of x and y should be purchased so that the consumer can obtain maximum satisfaction. To maximise her/his satisfaction, the consumer will equate $\frac{MU_x}{P_x}$ (per Birr MU_x) with $\frac{MU_y}{P_y}$ (per Birr MU_y).

This means that the consumer will equate the marginal utility of the last Birr spent on these two commodities. In order to know the position of the consumer's equilibrium, we may restructure the above mentioned table by dividing MU_x by Birr 4 and MU_y by Birr 2.

Table 3.3: Per Birr MU of x and y

Unit	MU_x/P_x	MU_y/P_y
1	20	20
2	18	19
3	16	18
4	14	17
5	12	16
6	10	15
7	8	14
8	6	13
9	4	12
10	2	11

To obtain maximum utility, the consumer will purchase 4 units of x and 7 units of y, because it satisfies the following two conditions required for the consumer's equilibrium:

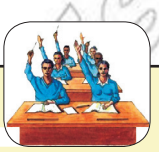
At 4 units of x = $\frac{MU_x}{P_x}$ = 14 and at 7 units of y = $\frac{MU_y}{P_y}$ = 14.

? $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$

Also, $P_x \times Q_x = 4 \times 4$ = Birr 16

$P_y \times Q_y = 2 \times 7$ = Birr 14 and I = Birr 30

? $P_x \times Q_x + P_y \times Q_y$ = I : (16 + 14 = 30)



Activity 3.2

1 Assume that a consumer consumes two goods, A and B. His/her limited income to spend on his/her consumption is Birr 10, and the price of good A is Birr 1 per unit and that of good B is Birr 2 per unit. From the following hypothetical data, find the level of his/her consumption, so that he/she maximises his/her utility.

Unit	Mu_A/P_A	Mu_B/P_B
1	10	24
2	8	20
3	7	18
4	6	16
5	5	12
6	4	6
7	3	4

2 In a group, discuss the law of diminishing marginal utility. Examine the application of the law in the case of different commodities. As a conclusion of your discussion, if possible, try to give an explanation (or more) for the basis of the law.

3 You have studied the Law of Demand in the previous unit and the Law of Diminishing Marginal Utility in this unit. In a group, discuss whether there is any relationship between the two laws. If possible, try to describe the relationship in your own words.

4 Does the law of diminishing marginal utility apply to money? Discuss this question in a group, and prepare a report on your observations.

3.3 THE ORDINAL UTILITY THEORY: INDIFFERENCE CURVE APPROACH

At the end of this section, you will be able to:

- define the concepts of indifference set, curve and map and the theory of ordinal utility;
- state the characteristics of indifference curves;
- elaborate the concept of marginal rate of substitutions;
- explain what a budget line is; and
- interpret how a change in consumer income and price affects, consumer satisfaction.

Key Terms and Concepts

- Ordinal utility
- Indifference curve
- Indifference set
- Indifference map

Start-up Activity

Can we numerically measure the satisfaction we derive from consuming a good? How do you compare the levels of satisfaction of consuming two different goods?

As utility is subjective, its measurement in absolute terms is not really possible. Keeping this in mind, modern economists have developed an alternative to the Cardinal Utility Theory. This is known as Ordinal Utility Theory, which deals with consumer behaviour under the assumption that utility from different units of a good or between different goods need only be rankable and not measurable. If a consumer gets more utility from bundle A than from bundle B, it means that the consumer will rank bundle A above bundle B. Her/his need is not known by "how much" A is preferred to B. This is the major premise on which the theory of ordinal utility is based.

Note

Since Ordinal Utility Theory makes use of indifference curves to study consumer behaviour, it is also known as Indifference Curve Approach.

Assumptions of Ordinal Utility Theory

- Rationality: A consumer aims to maximise her/his utility (subject to income and prices) under conditions of certainty.
- Complete Ordering: All possible combinations of goods can be ordered into preferred, indifferent or inferior combinations when compared to a given combination of the good.
- Consistency: This condition requires that if a consumer prefers bundle A to bundle B, he/she does not, at the same time, prefer bundle B to bundle A.
- Transitivity: If consumer prefers bundle A to B and B to C, she/he prefers A to bundle C.
- Non-satiation: A bigger bundle is preferred to a smaller bundle.
- Diminishing Marginal Rate of Substitution: This means that as the consumer substitutes more and more of one commodity (say Y) for another commodity (say X), she/he will be prepared to give up lesser units of the later (X) for each additional unit of the former (Y).

Indifference Set, Curve, and Map

Indifference Set

An indifference set refers to a table that shows various combinations of two goods which give equal level of satisfaction (utility) to the consumer. Since each of these combinations gives equal satisfaction, the consumer is indifferent among them.

Table 3.4: Indifference Set

Combination	Good X (units)	Good Y (units)
A	1	10
B	2	7
C	3	5
D	4	4

The above indifferent set shows that the consumer gets equal satisfaction from all the four combinations, namely, A, B, C and D of good X and good Y. At combination 'A', he/she has 1 unit of good X and 10 units of good Y; at combination 'B' he/she has 2 units of good X and 7 units of good Y and so on. In order to have one more unit of good X he/she has to sacrifice some amount of the good Y in such a way that there is no change in the level of his/her satisfaction from each of these combinations.

Indifference Curve

An indifference curve shows various combinations of two goods which give equal satisfaction to the consumer. It is the locus of points, each point representing a different combination of two goods, which yield the same level of satisfaction to the consumer so that he/she is indifferent between these combinations. In other words, an indifference curve is a graphical presentation of indifference set. Based on Table 3.4, indifference curve is shown in Figure 3.2.

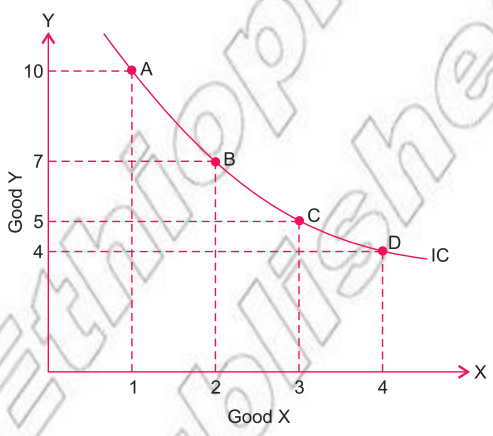


Figure 3.2: Indifference Curve

Different points A, B, C and D on indifference curve IC show the combinations of good X and good Y which give equal satisfaction to the consumer. An indifference curve is also known as Iso-Utility Curve or Equal-Utility Curve.

Indifference Map

An indifference map is a group or set of indifference curves, each one of which represents a given level of satisfaction. Figure 3.3 shows such an indifference map consisting of various indifference curves IC_1, IC_2, IC_3 and IC_4. Each indifference curve represents a different level of satisfaction. All points on a particular indifference curve indicate alternative combinations of good X and good Y that give the consumer an equal level of satisfaction.

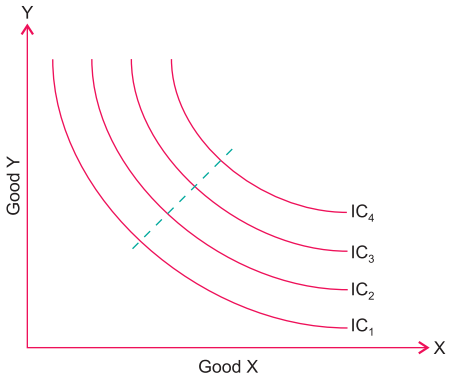


Figure 3.3: Indifference Map

The farther the curve is from the origin, the higher is the level of satisfaction it represents. For example, IC_3 a higher indifference curve than IC_2 which means that all points on IC_3 yield a higher level of satisfaction than the points on IC_2. Note that an indifference map represents the preference pattern of the consumer.

© MoE FDR Ethiopia Not to be republished

Properties of Indifference Curve

i Indifference curve is downward sloping: By definition, different points on an indifference curve represent the same level of utility. If we decrease the consumption of one good, obviously we need to increase the consumption of the other good to attain the same level of satisfaction as before the change. This gives rise to a downward sloping indifference curve.

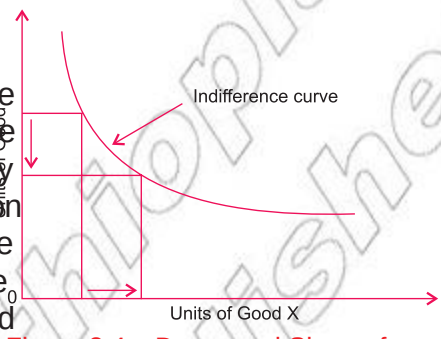


Figure 3.4: Downward Slope of Indifference Curve

ii Indifference curve is convex to the origin: Convexity of indifference curve implies that the two goods can substitute for one another, but not perfectly. As the consumer gets additional units of good X at the cost of good Y, marginal utility of good X (MU_X) decreases. On the other hand, due to reduced availability of good Y the marginal utility of Y (MU_Y) increases. So, the consumer would be ready to sacrifice lesser and lesser amount of Y for each additional unit of X. This gives rise to diminishing marginal rate of substitution. In case, the phenomenon of diminishing marginal rate of substitution holds good the indifference curve would be convex to the origin.

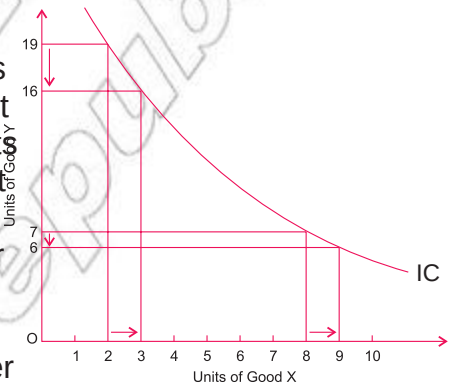


Figure 3.5: Convexity of Indifference Curve

iii Two indifference curves never intersect each other: Two indifference curves may lie close to each other, but they never intersect. This follows from the fact that each indifference curve represents different level of satisfaction so they do not intersect or touch each other. If the two indifference curves intersect each other, this would imply that a combination of two goods corresponding to the point of intersection would give two different levels of satisfaction, which is absurd.

Marginal Rate of Substitution (MRS)

The marginal rate of substitution of X for Y ($MRS_{X,Y}$) is defined as the number of units of good Y that must be given up in exchange for an extra unit of good X so that the consumer maintains the same level of satisfaction. In other words, it shows the rate at which one

good is substituted for another good, while remaining on the same indifference curve. Thus,

$$MRS_{x,y} = \frac{\text{Amount of Y lost}}{\text{Amount of X gained}} = \frac{\Delta Y}{\Delta X} \qquad (3.5)$$

Table 3.5: Marginal Rate of Substitution

Combination	Good X	Good Y	MRS_{xy}
A	1	12	
B	2	8	4
C	3	5	3
D	4	3	2
E	5	2	1

The above Table 3.5 shows that when the consumer moves from combination A to B, he gives up 4 units of Y for the gain of one additional unit of X. Therefore, his MRS of X for Y is given by

$$MRS_{x,y} = \frac{\Delta Y}{\Delta X} = \frac{4}{1} = 4$$

Similarly, when he/she moves from combination B to C, he/she forgoes 3 units of Y for the additional one unit gain in X and hence $MRS_{x,y} = 3$ and so on.

Observe that as a consumer consumes more and more of good X, $MRS_{X,Y}$ goes on diminishing. This is known as the principle of diminishing marginal rate of substitution, which means that the marginal rate of substitution of X for Y diminishes as more and more of good X is substituted for good Y. In other words, as the consumer has more and more of good X, she/he is prepared to forgo less and less of good Y.

The Budget Line or Iso-Expenditure Line

A good is demanded by the consumer if he/she has:

- a preference for that good, and
- purchasing power to buy the good, his/her preference pattern is represented by a set of indifference curves (indifference map), while his/her purchasing power depends upon her/his money income and market prices of the goods. Assume that the consumer has allocated some money to be spent on goods X and Y, whose prices are P_X and P_Y. Then his/her purchasing power can be represented in terms of a budget equation:

$$E = Q_X \cdot P_X + Q_Y \cdot P_Y \qquad (3.6)$$

Where, E = Expenditure on goods X and Y

Q_X and Q_Y 4 X D Q W L W \ R I J R<RUGH;V D Q I GWJLRYRHG \

P_X and P_Y = prices of good X and good Y respectively

The budget equation (Equation 3.6) gives us a budget line. Let a consumer have E = Birr 2,000, P_X = Birr 50 and P_Y = Birr 40. The maximum amount of X which he can buy can be found from his budget equation:

$$2000 = 50(Q_X) + 40(0) \text{ or } Q_X = 40$$

Similarly, we find that the maximum amount of Q_Y = 50.

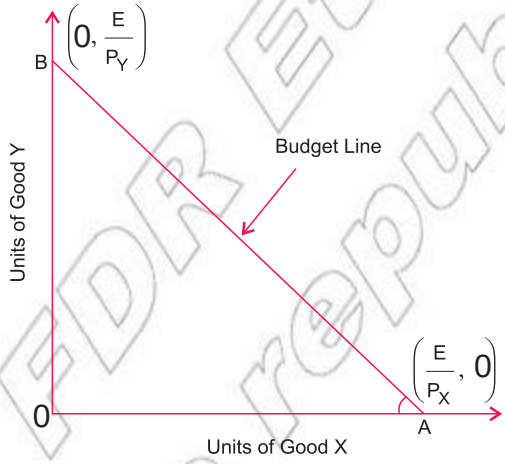


Figure 3.6: The Budget Line

So, the combinations (40, 0) and (0, 50) are possible consumption bundles within the budgeted amount of money. By joining these two points in a graph we get the budget line AB (Figure 3.6). All combinations of goods X and Y on the budget line can be purchased by the consumer if she/he spends whole of his allocated money on X and Y, given prices of goods X and Y.

In general, we may define budget line as a graph that shows various combinations of two commodities which can be purchased with a given budget at given prices of the two commodities. Any combination of the two commodities on or within the budget line is attainable, whereas any combination above the budget line is not attainable (because of the budget constraint).

Note that the slope of the budget line AB (Figure 3.6) would be equal to

___ ___ ___ relative prices of X and Y.

© MoE, FDR Ethiopia Not to be republished

Effect of Change in Income/Price of Goods

In case income of the consumer changes, with prices of the two goods remaining the same, there will be a parallel shift in the budget line (Figure 3.7). Whereas with a change in price of good, say X, (income and price of Y remaining constant), the budget line shifts only at its end touching the relevant-axis (X-axis here) (Figure 3.8). The budget line A_1B_1 shifts outward to A_1B_2 when price of X declines. It would have shifted inward if price of X increased.

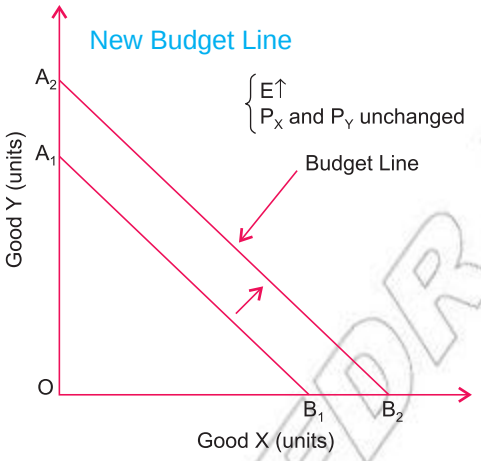


Figure 3.7: Change in Consumer's Income

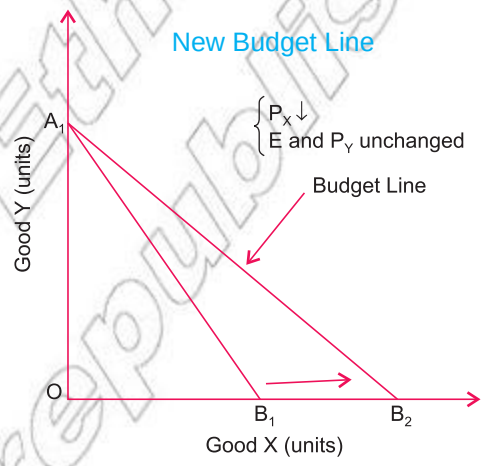


Figure 3.8: Decrease in Price of Good X

Consumer's Equilibrium

Now we can explain consumer's equilibrium with the help of the indifference curve approach (ordinal utility theory). As in the case of cardinal utility analysis, the indifference curve analysis also assumes that the consumer tries to maximise his/her utility.

A consumer shall be in equilibrium where she/he can maximise her/his utility, subject to her/his budget constraint. In other words, where the indifference curve and the budget line are tangent to each other (that is, their slopes are equal), the consumer will attain equilibrium. The equilibrium combination of the goods X and Y gives her/him maximum satisfaction because that relates to the highest indifference curve the consumer can reach within his/her available budget.

© MoE-EDR Ethiopia Not to be republished

This is shown in Figure 3.9, where E is the equilibrium point, having combination X* and Y* of goods X and Y respectively. Any other point, like (C, D, F, G, etc., cannot be considered as optimum point because it lies on a lower indifference curve than I_3 (where point E lies). On the other hand, any point like H is unattainable, because it is outside the budget line.

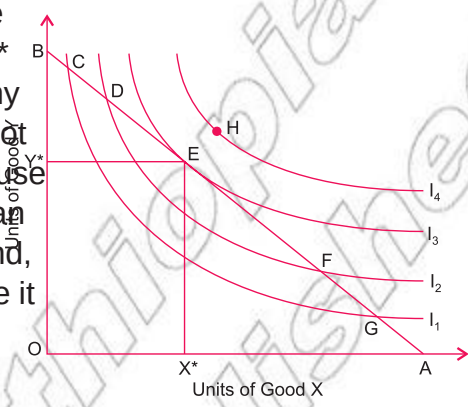


Figure 3.9: Consumer's Equilibrium

Note that at the point of tangency E,

Slope of budget line = Slope of indifference curve I_3

Also, slope of budget line = $\frac{P_x}{P_y}$ (price ratio of X and Y) and,

slope of indifference curve = $\frac{'Y}{'X} = MRS_{xy}$

?At equilibrium point E,

$$\frac{P_x}{P_y} = \frac{'Y}{'X} \qquad (3.7)$$

So we may express the condition of consumer equilibrium in another way, as below.

Price ratio of two goods = MRS

Income Effect (Income Consumption Curve)

When income of the consumer rises, the budget line moves outwards by the proportion of increase in the purchasing power. While when income declines the budget line moves inwards in accordance with the decrease in the purchasing power. For example, if the consumer's income increases from Birr 1,000 to Birr 1,200, P_X and P_Y remaining constant, the points A and B would instead shift to A_1 and B_1 respectively (Figure 3.10). Consequently, the new budget line is the straight line AB_1. There would, on the other hand, be a downward shift like A_2B_2 when income of the consumer declines. Thus, we get a family of budget lines depending on different levels of income of the consumer, given the prices

of the goods. We also know that for every budget line, there is an indifference curve which is tangent to it. When we join these points of tangency (E, E_1, E_2, E_3, etc.) we get an income consumption curve (ICC) which shows the way in which consumption varies as income of the consumer changes (prices remaining constant). This change is known as income effect. In case of normal goods, ICC slopes up and to the right.

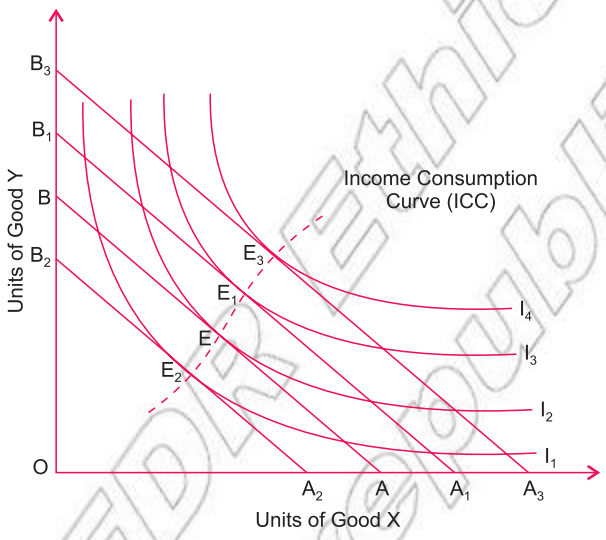


Figure 3.10: Income Effect

Price Effect (Price Consumption Curve)

As discussed earlier, when the price of a commodity falls, the consumer can buy more of it. So the budget line shifts to the right on that axis which represents that commodity. For example, in Figure 3.11, when the price of good X falls, the budget line shifts from AB_1 to AB_2, while, if the price of X rises, it shifts from AB_1 to AB_3. The new budget line (AB_2) is tangent to the higher indifference curve and a new equilibrium occurs at E_2 to the right of E_1, showing that as the price of X falls, more of X will be bought. If the price of X rises, the budget line shifts from AB_1 to AB_3 and the new equilibrium point E_3 is on a lower indifference curve. If we join the successive equilibrium

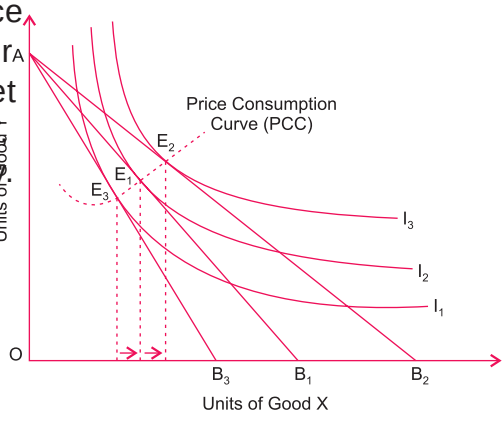


Figure 3.11: Price Effect

points, we get the price-consumption curve (PCC) which shows the way in which consumption varies as price of a commodity changes (income of the consumer and price of the other commodity remaining constant). This change is known as price effect.

Activity 3.3

1 You have learned that indifference curves are downward sloping. Draw one or more upward sloping curves, and consider different points on them to find the reason why an indifference curve does not slope upwards.

2 Examine the hypothetical data, given the following indifference set.

a Calculate $MRS_{x, y}$ for each stage of substitution.

b Does the third stage show less sacrifice of Y for X than the second stage?

Combination	Good X (units)	Good Y (units)
A	1	10
B	3	7
C	5	5
D	7	4

3 Consider a number of combinations of two goods that you consume. Fix any suitable amount as your planned expenditure for each combination of two goods. Identify the market price per unit of each good from each combination. Draw a budget line for each pair of goods. Based on a study of this set of budget lines, try to point out the main properties of a budget line. Prepare a report of your project and get it checked by your teacher.

© Model Not to be republished

UNIT SUMMARY

- Utility refers to the want-satisfying power of a commodity.
- Total utility refers to the total satisfaction derived by the consumer from the consumption of a given quantity of a commodity.
- Marginal utility refers to the additional utility derived from the consumption of an additional unit of a commodity.
- Total utility curve is concave from above, while marginal utility curve is negatively sloped.
- When total utility increases , marginal utility is positive , when total utility is maximum , marginal utility is zero, and when total utility decreases , marginal utility is negative .
- Assumptions of Cardinal Utility Theory are:
  - Consumer is rational,
  - Utility is measurable in cardinal numbers,
  - Utility gained from successive units of a commodity diminishes.
- Conceptually, utility is measured in units called utils.
- Law of diminishing marginal utility states that as the amount consumed of a commodity increases the utility derived by the consumer from the additional units (marginal utility) goes on decreasing.
- Consumer will be in equilibrium when he/she maximises the utility from his/her purchase.
- Law of equi-marginal utility states that a consumer gets maximum satisfaction when the ratio of marginal utilities of all commodities and their prices is equal.
- Assumptions of Ordinal Utility Theory are:
  - Consumer is rational,
  - All possible combinations of goods can be ordered in terms of preference,
  - Consumer's preference is consistent,
  - Consumer's preference follows transitivity,
  - Marginal rate of substitution (MRS) is diminishing.
- An indifference curve refers to a curve that shows various combinations of two commodities which give equal satisfaction to the consumer.
- An indifference map is a set of indifference curves, each one of which represents a given level of satisfaction.
- Properties of Indifference Curve:
  - An indifference curve slopes downward from left to right,
  - An indifference curve is convex to the origin,
  - Two indifference curves do not intersect each other ,
- Higher indifference curve gives higher satisfaction.

$$MRS_{x,y} = \frac{\text{Amount of Y lost}}{\text{Amount of X gained}} = \frac{\Delta Y}{\Delta X}$$

- Budget line shows various combinations of two commodities which can be purchased with a given budget at given prices of the two commodities. It is a negatively sloping line. Its slope is equal to the price-ratio of two commodities.
- Equilibrium of the consumer takes place at the point of tangency of budget line with indifference curve. At the point of tangency, marginal rate of substitution (MRS) = price ratios of two commodities, i.e.,

$$MRS_{x,y} = \frac{P_x}{P_y}$$

REVIEW EXERCISE FOR UNIT 3

I Write detailed answers to the following.

1 Explain the relationship between total utility and marginal utility.

2 Explain the 'law of diminishing marginal utility', using a diagram, and state its assumptions.

3 State the assumptions of cardinal utility theory.

4 Explain why consumer's equilibrium is attained when the marginal utility of a product is equal to its price?

5 State the assumptions of ordinal utility theory.

6 What is an indifference curve? What are the properties of an indifference curve? Explain with the help of diagrams.

7 What is meant by marginal rate of substitution? Discuss with examples the principles of diminishing marginal rate of substitution.

8 Discuss the concept of budget line and explain how change in income/price of goods shifts the budget line.

9 Explain consumer's equilibrium with the help of indifference curve.

10 Why does the consumer choose a point where the indifference curve is tangent to the budget line?

11 Discuss how a change in the income of a consumer affects his equilibrium consumption, when the prices of commodities remain constant.

12 Describe the concept of price consumption curve using diagram.

II Distinguish between the following:

13 Total utility and marginal utility.

14 Indifference set and indifference curve.

15 Cardinal and ordinal utility.

16 Price consumption curve and income consumption curve.

III Write 'True' or 'False' in case of each of the following:

17 Total utility is the sum of all marginal utilities.

18 Total utility increases as long as marginal utility is negative.

19 Total utility is minimum when marginal utility is zero.

20 Cardinal utility theory is given by modern economists.

21 Cardinal utility theory assumes that a consumer is rational.

22 An indifference curve is also known as iso-utility curve.

23 An indifference curve is upward sloping.

24 An indifference curve is convex to the origin.

25 When the income of the consumer rises, the budget line moves outwards.

26 Two indifference curves can touch each other at a common point.

IV Match the following:

	Column A		Column B
27	Ordinal utility	A	Sum of all marginal utilities
28	Negative MU	B	Law of diminishing marginal utility
29	TU is maximum	C	TU declines
30	Principle of diminishing marginal rate of substitution	D	Budget line moves inwards
31	Fall in consumer income	E	Utility cannot be measured
32	Total utility	F	MU is zero

V Write very short answers to the following questions

33 What is the conceptual unit to measure utility?

34 How is marginal utility derived from total utility?

35 How is total utility derived from marginal utility?

36 What is the shape of marginal utility curve?

37 When total utility is maximum how much is the marginal utility?

38 When is marginal utility negative?

39 State the law of diminishing marginal utility.

40 When is marginal utility positive?

41 State two assumptions of cardinal utility theory.

42 State two properties of an indifference curve.

43 State two assumptions of the law of diminishing marginal utility.

44 If total utility derived from 6 units of a good is 24, and that from 5 units is 25, what is the marginal utility of 6th unit?

45 What is consumer's equilibrium?

46 What is a budget line?

47 Why does the budget line slope downwards?

48 What determines the slope of the budget line?

49 State the condition of consumer's equilibrium in terms of cardinal utility approach.

50 State the condition of consumer's equilibrium in terms of indifference curve approach.

51 State one similarity between marginal utility approach and indifference curve approach.

52 State one difference between cardinal utility analysis and indifference curve analysis.

VI Numericals

53 Derive MU schedule of a person from the TU schedule given below and draw the graph of TU and MU.

Units of a Commodity	TU (utils)
0	0
1	20
2	35
3	45
4	53
5	60

54 The MU schedule of a person is given below. Derive his TU schedule, assuming that the TU of zero unit is zero.

Units of a Commodity	MU (utils)
1	8
2	10
3	7
4	5
5	3
6	0

55 Copy and fill in the 3rd column of the following table.

Units Purchased	MU	TU
1	8	
2	6	
3	4	
4	2	
5	0	
6	-2	

56 Copy and fill in the 4th column of the following table.

Combination	Good a (units)	Good b (units)	$MRS_{a,b}$
A	1	12	
B	2	8	
C	3	5	
D	4	3	
E	5	3	

57 Assume that the total expenditure of a consumer on two goods X and Y is E = Birr 2000, and prices of goods X and Y are P_X = Birr 50 and P_Y = Birr 40. Formulate his budget equation.

o

4

Unit Objectives

After completing this unit, you will be able to:

- comprehend and evaluate how firms combine economic resources so as to maximize output;
- realize stages and economic regions of production;
- explain the meanings and behaviours of various types of costs and integrate the relationship with production costs; and
- recognize the short run and long run production cost.

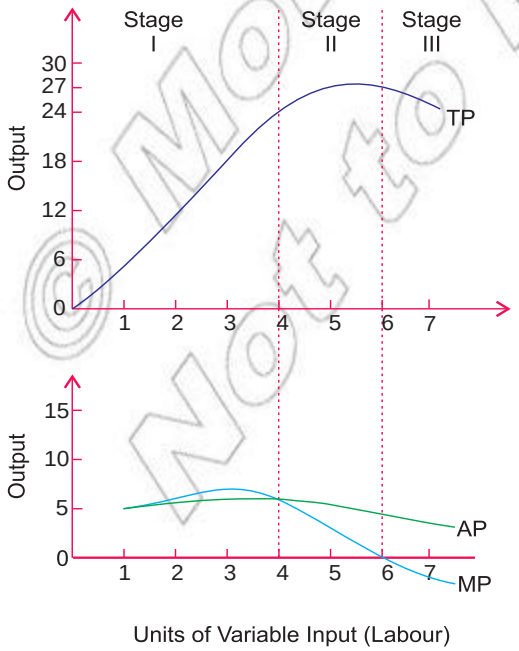
Main Contents

4.1 THEORY OF PRODUCTION

4.2 THEORY OF COST

4.3 RELATIONSHIP BETWEEN PRODUCTION AND COST

- Unit Summary
- Review Exercise



© Not to be republished

INTRODUCTION

Based on our discussion in Unit 2, we know that the supply price of a given level of output depends upon the cost of production of the corresponding level of output. Cost of production, in turn, depends upon:

- the physical relation between inputs and output and
- prices of inputs.

Assuming that the prices of inputs are given, cost of production will depend upon the physical relationship between inputs and output. A study of the relationship between inputs and output is known as the theory of production. A study of the relationship between output and cost of production is what we call theory of costs. In the present unit we discuss various aspects and elements of these two theories with a view to understand better the behaviour of firms (producer behaviour) in the production of goods and services.

4.1 THEORY OF PRODUCTION

At the end of this section, you will be able to:

- define production, input, and output;
- distinguish the differences between short-run and long-run production period;
- define production function;
- explain the concepts of production function with one variable input;
- distinguish the difference between total, average, and marginal product;
- show the relationship between average product and marginal product;
- describe the law of diminishing marginal product;
- identify and analyze the steps of productions;
- explain the concepts of production function with two variable input;
- define Isoquant curve schedule and map;
- state the basic characteristics of Isoquant;
- identify the economic region of production; and
- show the effects of te chnological change on production.

Key Terms and Concepts

- Input
- Short-run
- Long-run
- Production function
- Isoquant

Start up Activity

Discuss on the factors that affect production, pay a visit to the nearby farmland or factory and assess the factors that affect production.

Meaning of Production

Production is the transformation of resources (or inputs) into commodities (or outputs). For example, when we get wheat on a plot of land with the help of inputs like labour, capital and seeds, it is termed as production of wheat. Similarly, when, in a cloth mill, inputs like labour, capital and threads are transformed into cloth, it is called production of cloth. Similarly, in an economy, services are also produced. For instance, services of a teacher, an advocate, a doctor, a singer and servants are also called production in economics.

Input → Production → Output

Factors Affecting Production

Technology

A firm's production behaviour is fundamentally determined by the state of technology. Existing technology sets upper limits for the production of the firm, irrespective of the nature of output and size of the firm.

Inputs

Definition:

Inputs are economic resources that can be used in the production of goods and services.

There are wide variety of inputs used by the firms, like various raw materials, labour services of different kinds, machine tools, buildings, etc. All inputs used in production are broadly classified into four categories land, labour, capital and entrepreneurship. The inputs can also be divided into two main groups – fixed and variable inputs. A *fixed input* is one whose quantity cannot be varied during the period under consideration. Plant and equipment are examples of fixed inputs. An input whose quantity can be changed during the period under consideration is known as a *variable input*. Raw materials, labour, power, transportation, etc., whose quantity can often be increased or decreased on short notice, are examples of variable inputs.

Definition:

Outputs are outcomes of the production process.

Period of Production

The variability of an input depends on the length of the time period under consideration. The shorter the time period, the more difficult it becomes to vary the inputs. Economists classify time periods into two categories: the short-run and the long-run.

i Short-Run: Short-run refers to the period of time over which the amount of some inputs, called the 'fixed inputs', cannot be changed. For example, the amount of plant and equipment, etc., is fixed in the short-run. This implies that an increase in output in the short-run can be brought about by increasing those inputs that can be varied, known as variable inputs. For example, if a producer wishes to increase output in the short-run, she/he can do so by using more of variable factors like labour and raw material.

ii Long-Run: Long-run is defined as the time period during which all factors of production can be varied. A firm can install a new plant or raise a new factory building. Long-run is the period during which the size of the plant can be changed. Thus, all the factors are variable in the long-run.

It may be noted that the distinction between the short-run and the long-run does not correspond to a specific calendar period, such as a month or a year. It is rather based on the possibility of input adjustments.

Activity 4.1

Make a visit to about 2-3 production centres in your locality and collect information about their products, inputs and other factors of production. Prepare a detailed report on your field-survey based project.

Production Function

Meaning of Production Function

The production function is purely a technological relationship which expresses the relationship between the output of a good and the different combinations of inputs used in its production. It indicates the maximum amount of output that can be produced with the help of each possible combination of inputs.

The production function is written mathematically as:

$$Q = f(x_1, x_2, x_3, ..., x_n) \quad (4.1)$$

where $x_1, x_2, x_3, ..., x_n$ are different inputs and Q is amount of output.

The production function is based on two main assumptions,

- Technology does not change,
- Producers utilise their inputs at maximum levels of efficiency.

Production Function with One Variable Input

Before we take up a detailed analysis of production function with one variable input, certain key terms used in the analysis must be clarified. These are total product (TP), marginal product (MP) and average product (AP). The total product (TP) is the total amount of output resulting from the use of different quantities of inputs. If we assume labour (L) to be the variable input assuming (capital, etc., held constant) then marginal product of labour (MP_L) is defined as the change in total product (TP) per unit change in variable input, say labour (L), that is,

$$MP_L = \frac{\Delta TP}{\Delta L}. \quad (4.2)$$

Here ΔTP stands for change in total product and ΔL stands for change in labour input.

Similarly, average product of labour may be defined as

$$AP_L = \frac{TP}{L}. \quad (4.3)$$

Where, TP stands for total production

AP_L stands for average product for lobor.

Now let us consider a case where, for inputs like plant, machinery, floor space, etc., of a firm are all fixed, while only the amount of labour services (L) vary. That means that any increase or decrease in output is achieved with the help of changes in the amount of L. When the firm changes only the amount of labour, it alters the proportion between the fixed input and the variable input.

We go ahead with a hypothetical production schedule as shown in Table 4.1 below. Assume that capital is fixed at 1 unit, while L increases. Table 4.1 shows that the total product reaches a maximum of 27 when 6 units of labour are used.

The MP of labour for the 2nd unit of labour is 6. It then increases to 7 and ultimately becomes negative. Average product of labour also first increases and then falls.

Table 4.1: Hypothetical Schedule of TP, MP and AP

Variable Input (L)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)
0	0	—	—
1	5	5	5
2	11	6	5.5
3	18	7	6
4	24	6	6
5	27	3	5.4
6	27	0	4.5
7	25	-2	3.5

The above schedule can also be expressed graphically by drawing TP, MP and AP curves.

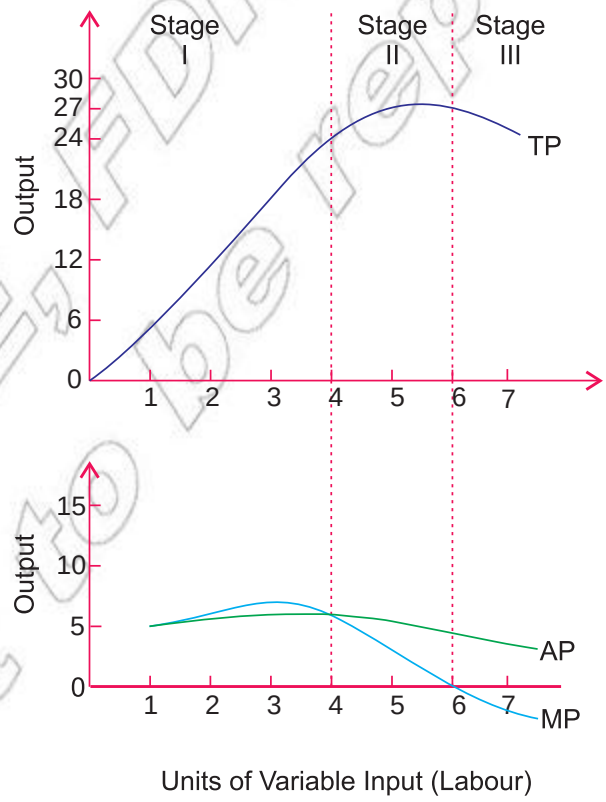


Figure 4.1: TP, MP and AP Curves Showing Three Stages of Production

© MoE-FDRC Not to be republished

Relationship Between Total Product, Marginal Product, and Average Product

The relationship between MP and AP:

- When MP > AP, this means that AP is rising,
- When MP = AP, this means that AP is maximum,
- When MP < AP, this means that AP is falling.

Graphically, the relationships between the MP curve and AP curve are as follows (see Figure 4.1):

- So long as the MP curve lies above the AP curve, the AP curve is a positively sloping curve, AP rises
- When the MP curve intersects the AP curve, AP is at maximum,
- When the MP curve lies below the AP curve, the AP curve slopes downward, i.e., AP declines.

The relationship between TP and MP:

- When TP increases at an increasing rate, marginal product increases,
- While TP increases at a diminishing rate, MP declines,
- When total product reaches its maximum, marginal product becomes zero,
- When TP begins to decline, MP becomes negative.

Stages of Production

The short-run production function (with one variable input) can be divided into three distinct stages of production. We may use Figure 4.1 to explain these stages. Stage I runs from zero units of variable input to the level where AP of labour is maximum. Stage II follows stage I and then proceeds to the point where MP of labour is zero (i.e., TP_L is maximum). Stage III continues on from that point. In Figure 4.1, Stage I ranges from zero to 4 units of labour, Stage II begins from 4 units to 6 units of labour and Stage III lies beyond 6 units of labour.

It is obvious that no 'rational' firm will choose to operate either in Stage I or in Stage III. In Stage I the firm is underutilising its fixed capacity, so in this stage marginal product of variable input rises (i.e., each additional unit of the variable factor contributes more to output than the earlier units). It is therefore profitable for the firm to keep on employing additional units of the input. In Stage III, the

firm over utilises its fixed capacity. In other words, it would have so little fixed capacity relative to the variable input it uses that the marginal contribution of each additional unit of the variable is negative. It is therefore inadvisable to use any additional units. Even if the cost of variable input is zero, it is still unprofitable to move into Stage III. It can, thus, be concluded that Stage II is the only relevant range for a rational firm.

For the sake of convenience, we can represent the three stages of production in tabular form as follows:

Table 4.2:

Stage	Total Product	Marginal Product	Average Product
I	Initially increases at an increasing rate and subsequently at a diminishing rate	Increases first, and reaches the maximum	Increases throughout the stage and reaches the maximum
II	Continues to increase at a diminishing rate, and eventually reaches the maximum	Starts to decrease and eventually becomes zero	From the maximum begins to decrease
III	Diminishes	Is negative	Continues to decrease but is always positive

The Law of Diminishing Marginal Returns

The law states that as more and more of one factor input is employed, assuming all other input quantities held constant, a point will eventually be reached where additional quantities of the varying input will yield diminishing marginal contributions to total product

Table 4.3:

Variable Factor (Units of Labour)	Total Product	Marginal Product
1	20	20
2	35	15
3	45	10
4	50	5

Observe from Table 4.2 and Figure 4.2 that when more and more units of labour are employed with a given quantity of a fixed factor, TP increases at a diminishing rate or MP continuously falls. That is why the shape of the MP curve is downward sloping.

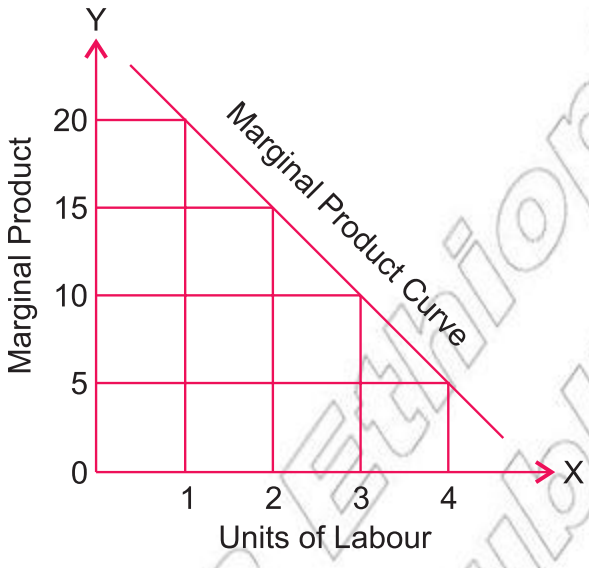


Figure 4.2: Marginal product curve

Note that:

- the law operates only if technology does not change
- the law starts to operate after the MP curve reaches its maximum (see Figure 4.1)
- the law is universal because the tendency of diminishing return is all pervading, and so it applies sooner or later in every field of production.

Production Function with Two Variable Inputs

We now discuss a more general case where the firm increases its output by using more of two inputs that are substitutes for each other, say, labour and capital. The two-variable-input case may be taken either as a short-run or a long-run analysis of a production process, depending on what assumption is made about the nature of the firm's inputs. If the firm uses only two inputs and both of them are variable, then this is a case of long-run analysis. In contrast, if more than two inputs are used but only two of them are variable (and the others fixed), then this would be taken as a short-run analysis.

Let us assume a firm wants to produce 20 units of output by using two variable inputs, X and Y (say labour and capital respectively). It can do so by employing different combinations of X and Y. We show these combinations in Table 4.4

© MoE-OER Ethiopia Not to be published

Table 4.4: Factor Combinations to Produce a Given level of Output (Isoquant Schedule)

Factor Combinations	labour (units)	Capital (units)	Output (units)
A	1	12	20
B	2	8	20
C	3	5	20
D	4	3	20
E	5	2	20

To start with, factor combination A consisting of 1 unit of labour X and 12 units of capital Y produces the given 20 units of output. Similarly, combination B consisting of 2 units of labour and 8 units of capital, combination C consisting of 3 units of labour and 5 units of capital, combination D consisting of 4 units of labour and 3 units of capital, and combination E consisting of 5 units of labour and 2 units of capital are capable of producing the same amount of output, i.e., 20 units.

A tabular representation of the various combinations of two variable inputs which give the same level of output is called an isoquant schedule or equal product schedule.

Isoquant

An isoquant is a curve representing the various combinations of two inputs that produce the same amount of output. An isoquant is also known as an iso-product curve, equal-product curve, or production indifference curve. An isoquant may, therefore, be defined as a curve which shows the different combinations of the two inputs that produce a given level of output.

Using the data given in Table 4.4, we can construct an isoquant or equal product curve. By plotting different combinations of labour and capital required to produce 20 units of output and then joining these points by a curve, we get an isoquant (Figure 4.3).

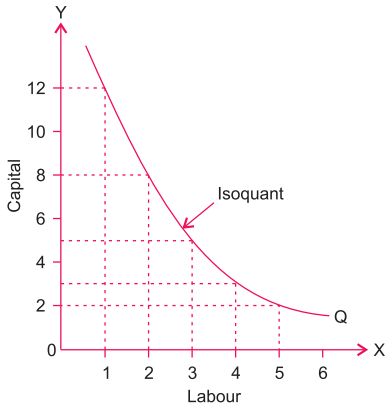


Figure 4.3: Isoquant

Any combination of labour and capital on the above isoquant gives 20 units of output.

Isoquant (or Equal-Product) Map

For each level of output, there is a different isoquant. When the whole array of isoquants is represented on a graph, it is called an Isoquant Map (Figure 4.4). It shows how outputs vary as the factor inputs are changed. A higher isoquant represents a higher level of output. However, the distance between any two isoquants does not measure the absolute difference in the volume of output they represent.

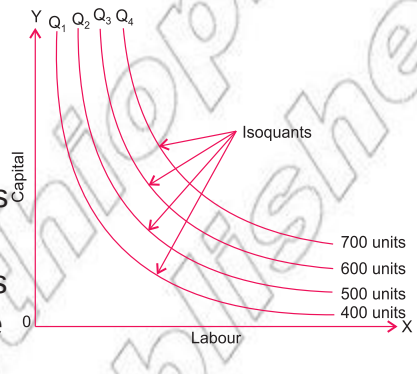


Figure 4.4: Isoquant Map

Properties of Isoquants

- An isoquant is downward-sloping to the right (i.e., negatively inclined), implying that if more of one factor is used, less of the other factor is needed for producing the same level of output.
- No two isoquants intersect or touch each other. If two isoquants intersect or touch each other it means that there is a common point on the two curves (point A in Figure 4.6). This common point would imply that the same amount of labour and capital can produce two levels of outputs (example, 60 and 70 units, here), which is impossible.

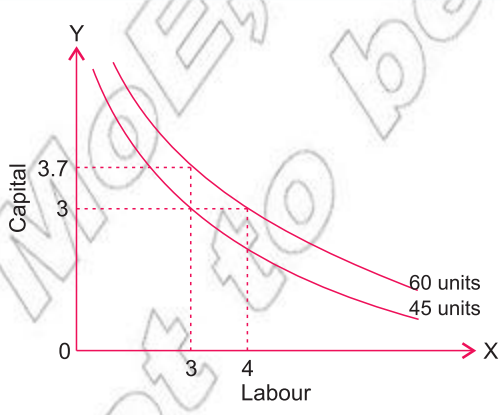


Figure 4.5: Higher Isoquant vs. Lower Isoquant

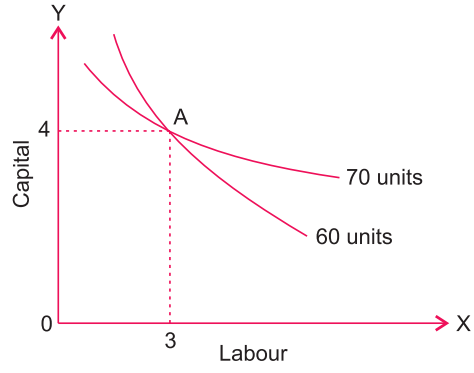


Figure 4.6: Intersection of Isoquants (impossible condition)

- Isoquants are convex to the origin. The property of convexity implies that the slope of the isoquant diminishes from left to right along the curve. Convexity of an isoquant is the result of the principle of diminishing

marginal rate of technical substitution (MRTS) of one factor in place of the other. We discuss MRTS more in a later sub-section.

Economic Region of Production

Economic theory states that the producer operates on the efficient ranges of output. These are the ranges over which the marginal products of the inputs are diminishing but positive. When the marginal products of inputs are negative, the methods of production are considered inefficient. The efficient range of output is represented by the portion of an isoquant that has a negative slope, while the inefficient combinations of inputs are represented by the positively sloped portions of an isoquant. A positive slope of an isoquant means that merely to maintain the same level of output, the firm must use more of both of the inputs. What is happening in this situation is that the marginal product of one of the inputs is negative (i.e., its additional use will lead to a fall in output), so in order to maintain the output at the same level, more of the other inputs (having positive marginal product) must be used.

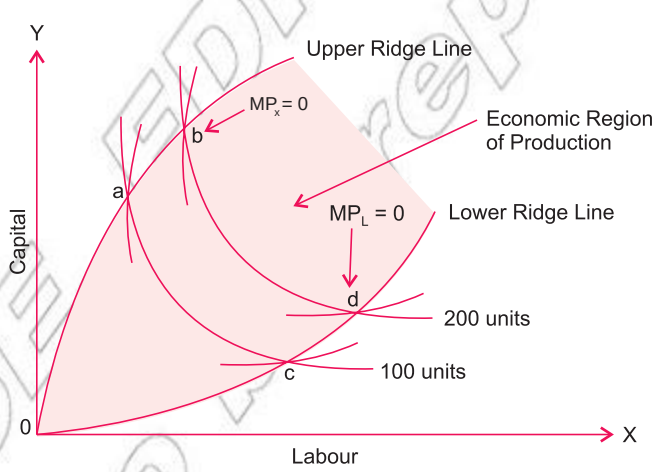


Figure 4.7: Economic Region of Production (Ridge Line)

In order to separate the efficient ranges of output from the inefficient ranges, we need to draw lines between the negatively sloped and the positively sloped portions of the isoquants. Such lines are known as ridge lines. A ridge line is the locus of points of isoquants where marginal product of input is zero. In Figure 4.7, the upper ridge line joins all such points (for example, a, b, etc.) where marginal product of capital (MP_K) is zero, while the lower ridge line joins points where marginal product of labour (MP_L) is zero (points c, d, etc.). The production techniques are technically efficient inside the ridge lines. Outside the ridge lines, the marginal products of inputs are negative, i.e., more of both inputs are required

to produce a given level of output. Obviously, no rational producer would like to operate outside the ridge line. Thus, the economic region of production is the region bounded by the ridge lines

Marginal Rate of Technical Substitution (MRTS)

Marginal rate of technical substitution in the theory of production is similar to the concept of marginal rate of substitution in the indifference curve analysis of consumer behaviour. A marginal rate of technical substitution is the rate at which factors can be substituted at the margin without altering the level of output. More precisely,marginal rate of technical substitution of labour for capital may be defined as the number of units of capital which can be replaced by one unit of labour, the level of output remaining unchanged. The concept of marginal rate of technical substitution can be easily understood from Table 4.5

Table 4.5: Marginal Rate of Technical Substitution

Factor Combinations	Units of Labour (L)	Units of Capital (K)	MRTS of L for K
A	1	12	—
B	2	8	4
C	3	5	3
D	4	3	2
E	5	2	1

Each of the input combinations, A, B, C, D and E, yields the same level of output. Moving down the table from combination A to combination B, 4 units of capital are replaced by 1 unit of labour in the production process without any change in the level of output. Therefore, MRTS of labour for capital is 4 at this stage. Switching from input combination B to input combination C involves the replacement of 3 units of capital by an additional unit of labour, to keep output remaining the same. Thus, MRTS is now 3. Likewise, MRTS between factor combinations C and D is 2, and between factor combinations D and E is 1.

$$\text{MRTS of labour for capital} = \frac{'K}{'L} \quad \frac{\text{Amount of capital given up}}{\text{Amount of labor used}} \qquad (4.4)$$

û. UHSUHVHQWV FKDQJH LQ XQLWV RI FDSLWDO I

An important observation that we can make from the above discussion is that marginal rate of technical substitution diminishes as more and more labour is substituted for capital. In other words, as the quantity of labour used is increased and the quantity of capital employed is reduced, the amount of capital that must to be replaced by an additional unit of labour, so as to keep the output constant, diminishes. This is known as the Principle of Diminishing Marginal Rate of Technical Substitution.

Note:

- MRTS at a point on an isoquant = the slope of the isoquant at that point.
- The property of diminishing MRTS results in convexity of the isoquant.

Returns to Scale (Production with all Variable Inputs)

In the previous sections we have discussed how output varies with a change in one or two variable inputs. What happens if all inputs (factors of production) are made to change?

In the short run, some factor inputs can be varied while the others remain fixed. But in the long run, time is sufficient enough to vary all the factor inputs. In other words, no input or factor is fixed in the long run. When all factor inputs can be varied, keeping their proportion constant, it is called a change in the scale of operations. The behaviour of output consequent to such changes in the quantities of all factor inputs in the same proportion (i.e., keeping the factor proportions unaltered) is known as 'returns to scale'. Alternatively when all the factors required for production of a commodity are increased in a given proportion, the scale of production increases and the change caused in return (output) is called return to scale. In such a situation, three types or stages of returns are usually noticed.

- Increasing Returns to Scale: It occurs when output increases by a greater proportion than the proportion of increase in all the inputs.
- Constant Returns to Scale: It happens when output increases by the same proportion as of inputs increase.
- Diminishing Returns to Scale: It occurs when output increases by a smaller proportion than the proportion of in input increases.

We illustrate these three stages with the help of following hypothetical schedule.

Table 4.6: Returns to Scale

Sr. No.	Scale of Inputs	Total Product (mts)	Marginal Product (mts)	Returns to Scale
1	2 labourers + 1 machine	200	200	Increasing
2	4 labourers + 2 machines	500	300	
3	6 labourers + 3 machines	900	400	
4	8 labourers + 4 machines	1400	500	Constant
5	10 labourers + 5 machines	1900	500	
6	12 labourers + 6 machines	2400	500	
7	14 labourers + 7 machines	2800	400	Decreasing
8	16 labourers + 8 machines	3100	300	
9	18 labourers + 9 machines	3300	200	
10	20 labourers + 10 machines	3400	100	

We assume here that the firm is employing only two factors, namely, labour and capital. Labour is measured in man-hours, capital in machine-hours, and output in metres. As shown in the table, 2 units of labour and 1 unit of machine produce 200 metres of cloth in the beginning.

We can also represent the three stages of returns diagramatically by converting the above Table 4.6 into the following diagram.

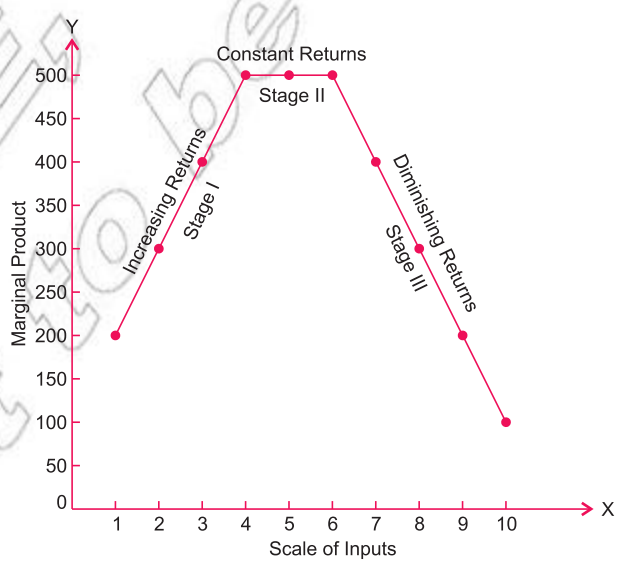


Figure 4.8: Returns to Scale

Reasons for Increasing and Decreasing Returns

Reasons for operation of increasing returns to scale are:

- Greater division of labour and specialisation which increases productivity.
- Use of more productive specialised machinery.

Reasons for operation of diminishing returns to scale are:

- The main reason for operation of diminishing return to scale is difficulty in management and coordination when scale of operation becomes bigger and bigger.

Effect of Technological Change on Production Function

Technological change refers to a change in the underlying techniques of production, as occurs when a new process of production is invented or an old process is improved. In such situations, the same output is produced with fewer inputs or more output is produced with the same inputs. These changes in technology are called technological progress or innovation in processes.

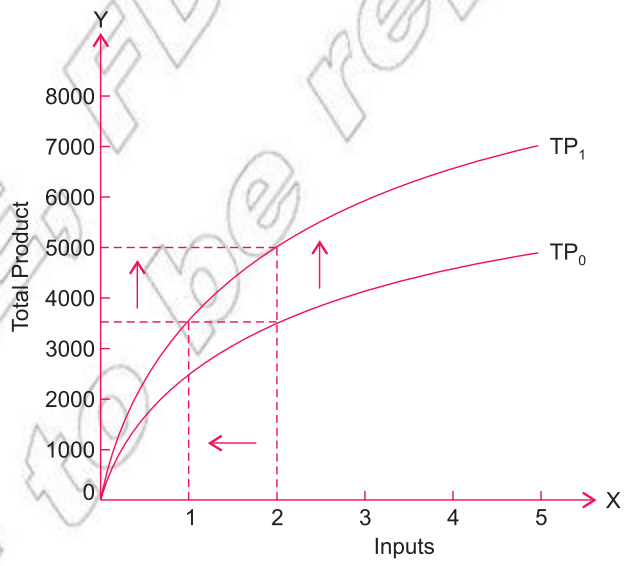


Figure 4.9: Technological Progress Shifts Production Function Upward

Graphically, the effect of innovation in processes is shown with an upward shift of the production function. This shift shows that the same output may be produced by using fewer factor inputs, or more output may be obtained with the same inputs.

Activity 4.2

1 Discuss the effect of technological change on the production function.

2 Complete the following table:

Units of Labour	Total Product	Marginal Product	Average Product
1	50		
2	90		
3	120		
4	140		
5	150		
6	150		
7	140		
8	120		

3 Copy and complete the following table:

Units of Capital	Total Product	Average Product	Marginal Product
1			20
2			16
3			12
4			8
5			4

4 Using the information given in the following table, express graphically the behaviour of the TP, MP, and AP curves.

Land Fixed Factor (units)	Labour Variable Factor (units)	Total Product (units)	Marginal Product (units)	Average Product (units)
1	0	0	—	—
1	1	20	20	20
1	2	50	30	25
1	3	90	40	30
1	4	120	30	30
1	5	140	20	28
1	6	150	10	25
1	7	150	0	21.43
1	8	140	–10	17.5
1	9	120	–20	13.33

5 Identify the different output levels which mark the three stages of production in the following data:

Units of Variable Input	Total Product (TP) (units)
0	–
1	100
2	220
3	360
4	520
5	650
6	750
7	840
8	880
9	880
10	830
11	770

6 Calculate MRTS for each combination given in the following table:

Combination	Units of Capital (K)	Units of Labour (L)
A	1	15
B	2	10
C	3	6
D	4	3
E	5	1

Do you observe that MRTS diminishes as more and more capital is substituted for labour?

4.2 THEORY OF COST

At the end of this section, you will be able to:

- define cost;
- differentiate private and social cost;
- distinguish the difference between explicit and implicit cost;
- differentiate short-and long-run costs of production period;
- distinguish the differences among fixed, variable, and total costs;
- define marginal cost; and
- explain the long-run cost of production.

Key Terms and Concepts

- Production
- Cost
- Input
- Entrepreneurship
- Short run
- Long run
- Fixed cost
- Variable cost
- Total cost
- Marginal cost

Start-up Activity

Assume an old fashioned tannery which purchases hides and skins from near by society. The tannery discharges hazardous chemicals to human health and peasants have no means to mitigate its effects. Discuss what society gain and loss due to the presence of this tannery.

For producing a commodity, a firm requires various factor inputs as well as non-factor inputs. The expenditures the firm incurs on these inputs refers to the cost of production. However, in economics, we use different concepts relating to cost. There are different types of cost. Some of the important ones are discussed in the following paragraphs. Costs are the monetary values of expenditures that have been used to produce something.

Private Cost and Social Cost

In economic analysis we often distinguish between private cost and social cost. Private cost refers to cost of production incurred by an individual firm in producing a commodity. Social cost, on the other hand, refers to the cost that the society has to bear on account of production of a commodity. Social cost is a wider concept than private cost. It is the sum total of the cost incurred by the producers of goods and services (private cost) and the cost experienced by those who have to suffer because of the production of the commodity in terms of external cost.

Thus,

$$\text{Social Cost} = \text{Private Cost} + \text{External Cost} \qquad (4.5)$$

'External cost' is the cost that is not borne by the firm, but is incurred by other members of the society or the entire society. Such costs are termed external costs from the firm's point of view and social costs from society's point of view. For instance, an oil refinery discharges its wastes into a river, causing water pollution;

mills and factories located in a city cause air pollution by emitting smoke; and buses and trucks and other vehicles cause both air and noise pollution. Such water, air and noise pollution cause health hazards and thereby produce pervasive costs to the entire society. These costs are not taken into account by the individual producers and, therefore, they are not part of the private cost. But the true cost to the society must include all such costs, regardless of who bears them. Thus, social cost differs from private cost to the extent of external cost.

Explicit Cost and Implicit Cost

Actual payments made by a firm for purchasing or hiring resources (or factor-services) from the factor-owners or other firms are called explicit costs. In other words, explicit costs are actual money expenses directly incurred for purchasing the resources. These are the costs which a cost accountant includes under the head expenses of the firm and are also known as accounting costs. Thus, examples of explicit costs are: payments for raw materials and power; wages to the hired workers; rent for the factory building; interest on borrowed money; expenses on transport and publicity, etc.

Besides purchasing resources from other firms, a producer uses his/her own factor services in the process of production. He/she generally does not take into account the costs of his/her own factors while calculating the expenses of the firm. The cost of using such factors is called implicit costs or imputed costs. Thus, implicit costs refer to the imputed costs of the factors of production owned by the producer himself/herself. They are called implicit costs because producers do not make payment to others for them. For instance, rent of his/her own land, interest on his/her own capital, and salary for his/her own services as manager, etc. are implicit costs.

The main difference between explicit costs and implicit costs is that in the former case, payment is made to others, while in the latter case payment is not made to others but the payments become due to the producer's own factors of production.

Economists define cost of production in a wider sense, i.e., in the sense of economic cost, which includes both explicit cost and implicit cost. Thus, economic cost is the sum total of explicit cost and implicit cost

$$\text{Economic Cost} = \text{Explicit Cost} + \text{Implicit Cost} \qquad (4.6)$$

Activity 4.3

1 Identify two production units (producing goods or services) in your local area and list your economics workgroup, their explicit and implicit costs of production.

2 In discuss various production activities from the point of view of their social costs and private costs, and try to identify the cases where social costs could be lower than private costs. Make a list of some examples where social costs are higher than private costs and vice-versa.

Time Element and Cost

Time element has an important place in the analysis of cost of production. We usually consider two kinds of time periods. They are:

- Short Run: Short run is defined as a period of time during which production can be varied only by changing the quantities of variable factors and not of fixed factors. Land, factory buildings, heavy capital equipment, and services of high-category management are some of the factors that cannot be varied in a short period. That is why they are called fixed factors.

  On the other hand, there are some factor inputs that can be varied as and when required – for instance, power, fuel, labour, raw materials, etc. They are called variable factors. Accordingly, in short-run production, we have two types of costs - fixed costs and variable costs.

- Long Run. Long run is defined as a period which is long enough for the inputs of all factors of production to be varied. In this period, no factor is fixed, and all are variable factors. Accordingly, in the long run, all costs are variable costs.

Short-Run Cost of Production

Total Costs in the Short Run

There are three concepts concerning total cost in the short period: Total Fixed Cost, Total Variable Cost, and Total Cost. Fixed cost is that cost which is incurred for fixed factors Fixed costs consist of salary of the permanent staff, interest on borrowed capital, rent of the factory buildings, depreciation of machinery, expenses for maintenance of buildings, property tax and license fees etc.

Variable cost is cost which is incurred for variable factors. The main types of variable cost are expenditures incurred for raw materials, wages and salaries paid to casual workers, operating expenses like electricity, and taxes such as excise duties, which depend upon the output produced.

Total cost of production is the sum of all fixed and variable costs. Corresponding to fixed and variable factors in the short-run, total cost is divided into two parts:

- Total fixed cost and
- Total variable cost.

1 Total Fixed Cost (TFC):Total fixed cost refers to the total cost incurred by the firm for the use of all fixed factors. This cost is independent of output, i.e., it does not change with change in quantity of output. Fixed cost is also known as overhead cost. Even if the firm produces only one unit of output, the fixed cost are incurred. In fact, even if nothing is produced for some time in the short-run, fixed costs are incurred. That is why fixed cost is often known as 'unavoidable cost'. For example, a shop-keeper has to pay rent for the shop, no matter what the output or sale is during the month.

2 Total Variable Cost (TVC):Total variable cost refers to the total cost incurred by a firm for the use of the variable factors. These costs vary directly with changes in the volume of output, rising as more is produced and falling as less is produced. That is why variable cost is also known as 'avoidable cost'. For instance, if you want to produce more shirts, you have to buy more raw materials like yarn and hire more workers.

3 Total Cost:Total cost is the cost incurred on all types of inputs – fixed as well as variable inputs – incurred in producing a given amount of output.

Table 4.7: Total Fixed Cost, Total Variable Cost, and Total Cost

Output (Units)	TFC (Birr)	TVC (Birr)	TC (Birr)
0	60	0	60
1	60	40	100
2	60	76	136
3	60	102	162
4	60	132	192
5	60	170	230
6	60	222	282

$$TC = TFC + TVC \quad (4.7)$$

Since total cost has total variable cost as one of the components which varies with change in output, the total cost will also change positively with change in output. Also, since total fixed cost, by definition, remains constant, the changes in total cost are entirely due to changes in total variable cost. Table 4.7 and Figure 4.10 explain the behaviour of various types of total cost in the short run.

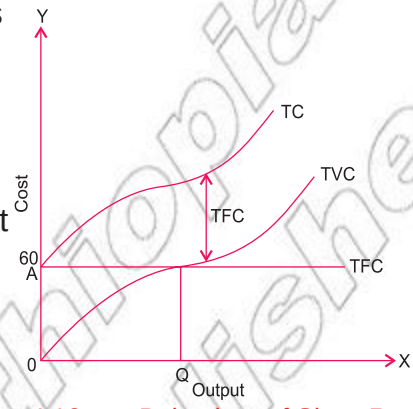


Figure 4.10: Behaviour of Short-Run Total Costs

TFC curve: As Table 4.7 shows, total fixed cost remains constant at Birr 60 for the entire range of output from 0 to 6 units. It does not change with change in output. The TFC curve is a straight line parallel to the horizontal axis, indicating the same amount of fixed cost at every level of output. Note that in Figure 4.10, the TFC curve starts from point A on the Y-axis, indicating that the total fixed cost is incurred even if output is zero.

TVC curve: Total variable cost changes with change in output. Initially, it increases at a decreasing rate as total output increases (up to 3 units), and subsequently it increases at an increasing rate with increases in output (from the 4th unit onwards). The TVC curve is a positively sloping curve, showing that, as output increases, total variable cost also increases. But the rate of increase of TVC is not the same throughout. The TVC curve is concave downward, up to the OQ level of output, indicating that the total variable cost increases at a decreasing rate, and subsequently (beyond the OQ level of output) is concave upward, indicating that total variable cost increases at an increasing rate. Also note that the TVC curve starts from the origin, which shows that when output is zero, total variable cost is also zero.

TC curve: Since total cost is the sum of total fixed cost and total variable cost, it is calculated in Table 4.7 by adding figures of column 2 and column 3 at different levels of output. The total cost varies directly with output because of increases in variable costs with increases in output. The TC curve has been obtained by adding up vertically the TFC curve and the TVC curve. Since a constant fixed cost is added to the total variable cost, the shape of the TC curve is the same as that of the TVC curve. Note that the TC curve originates not from 0, but from A because, at zero level of output, total cost equals fixed cost. The vertical distance between the TVC and TC curves equals the amount of the total fixed cost.

© MoE-EDRI Ethiopia Not to be republished

Average Costs in the Short Run

Average cost is simply the total cost divided by the number of units produced. Corresponding to the three types of total costs in the short run, there are three types of average costs. Average Fixed Cost, Average Variable Cost, and Average Total Cost.

- Average Fixed Cost (AFC): Average fixed cost is the per-unit cost of the fixed factors. It is obtained by dividing the fixed cost by the total units of output.

$$AFC = \frac{TFC}{Q} \qquad (4.8)$$

Where Q represents the total units of output produced.

- Average Variable Cost (AVC): Average variable cost is the per-unit cost of the variable factors of production. It is obtained by dividing the total variable cost by the total units of output.

$$AVC = \frac{TVC}{Q} \qquad (4.9)$$

- Average Cost (AC) or Average Total Cost (ATC): Average total cost or simply average cost is the per-unit cost of both fixed and variable factors of production. It is obtained by dividing total cost by the total units of output.

$$AC \text{ or } ATC = \frac{ATC}{Q} \qquad (4.10)$$

Also, $AC = \frac{TC}{Q}$

$= \frac{TFC + TVC}{Q}$ [Since TC = TFC + TVC

$= \frac{TFC}{Q} + \frac{TVC}{Q}$

$= AFC + AVC$

$$AC \text{ or } ATC = AFC + AVC \qquad (4.11)$$

The following schedule (based on Table 4.3), together with the corresponding average cost curves, explain the behaviour of various types of average costs in the short run.

Table 4.8: Behaviour of average cost

Output (Units)	TFC (Birr)	TVC (Birr)	TC (Birr)	AFC (Birr)	AVC (Birr)	ATC (Birr)	MC (Birr) = (ΔTC/ΔQ)
(1)	(2)	(3)	(4) (2 + 3)	(5) (2÷1)	(6) (3÷1)	(7) (4÷1) or (5+6)	(8) ($TC_n - TC_{n-1}$)
0	60	0	60	–	–	–	–
1	60	40	100	60	40	100	40
2	60	76	136	30	38	68	36
3	60	102	162	20	34	54	26
4	60	132	192	15	33	48	30
5	60	170	230	12	34	46	38
6	60	222	282	10	37	47	52

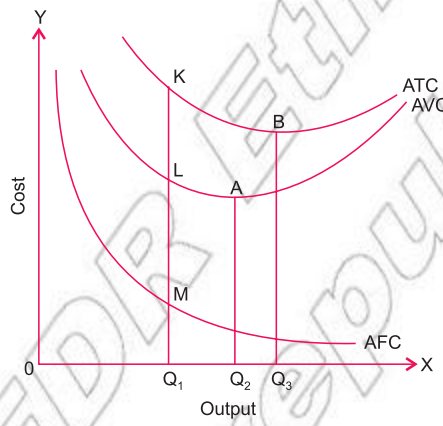


Figure 4.11: Behaviour of Average Costs

AFC Curve

It slopes downward throughout its length, from left to right, showing a continuous fall in average fixed cost with increases in output. For very small outputs, the average fixed cost is high, and for large outputs it is low. The curve approaches the X-axis but never touches it because the average fixed cost cannot be zero since total fixed cost is positive. Similarly, the AFC curve never touches the Y-axis because total fixed cost has a positive value even at very low levels of output.

AVC Curve

The behaviour of the average variable cost is derived from the behaviour of the total variable cost. The AVC curve slopes downward, up to output OQ_2 (the optimum capacity level of output), showing decreases in average variable cost, and it slopes upward beyond output OQ_2, indicating increases in average variable cost. In other words, the AVC curve is U-shaped. It is minimum at A, corresponding to optimum capacity level of output, OQ_2

Why is the AVC Curve U-shaped? The U-shape of the AVC curve follows directly from the law of variable proportions. The average variable cost falls up to the optimum capacity level of output due to increasing returns, and it increases thereafter due to diminishing returns to the variable factor.

ATC Curve

Geometrically, the ATC Curve (or AC curve) can be obtained by adding the AFC and AVC curves. An ATC curve is the vertical summation of the AFC and AVC curves. Therefore, at each level of output, the ATC curve lies above the AVC curve at a distance equal to the value (height) of the AFC curve.

Following are some important observations about the ATC curve.

- The distance between the average cost curve and the average variable cost curve gets smaller as production increases. The ATC curve is far above the AVC curve at early levels of output because the average fixed cost is a high percentage of the average total cost. But the ATC curve tends to come closer to AVC at higher levels of output because average fixed cost now accounts for a relatively small percentage of average total cost. Notice that the ATC curve never touches AVC the curve because average fixed cost is always positive.
- The ATC curve is U-shaped, indicating that average total cost falls initially, then reaches the minimum point, and then starts rising. It is U-shaped for the same reasons for which the AVC curve is U-shaped.

Marginal Cost in the Short Run

Marginal cost is the addition to total cost as one more unit of output is produced. In other words, marginal cost is the addition to total cost of producing n units instead of $n-1$ units.

$$MC_n = TC_n - TC_{n-1} \qquad (4.12)$$

Since the marginal cost is the change in total cost as a result of the change in output by one unit, it can be written as:

$$MC = \frac{\Delta TC}{\Delta Q} \qquad (4.13)$$

: K H U H û 7 & L V F K D Q J H L Q W R W D O F R V W D Q G output.

In Figure 4.12, the MC curve is the marginal cost curve.

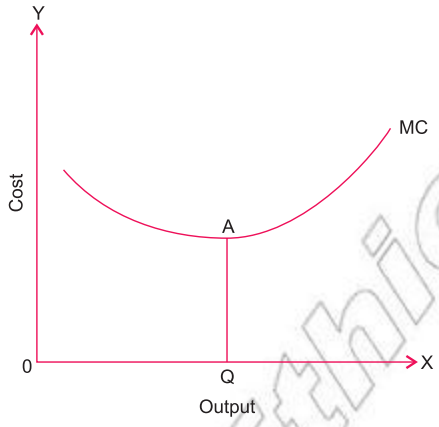


Figure 4.12: Short-Run MC Curve

The following points should be noted with regard to marginal cost:

- Marginal cost has nothing to do with fixed cost. It is associated with the variable cost and thereby with total cost.
- The MC curve is U-shaped. As output increases, the MC curve slopes downward (up to OQ units), them reaches the minimum (at point A) and then starts sloping upward beyond the OQ level of output. The U-shape of the MC curve is because of the law of variable proportions. It is negatively sloped in the initial stage of production due to increasing returns to a factor, and it is positively sloped thereafter due to decreasing returns.

Relation Between Average and Marginal Cost

The relationship between average and marginal cost is shown graphically in Figure 4.13

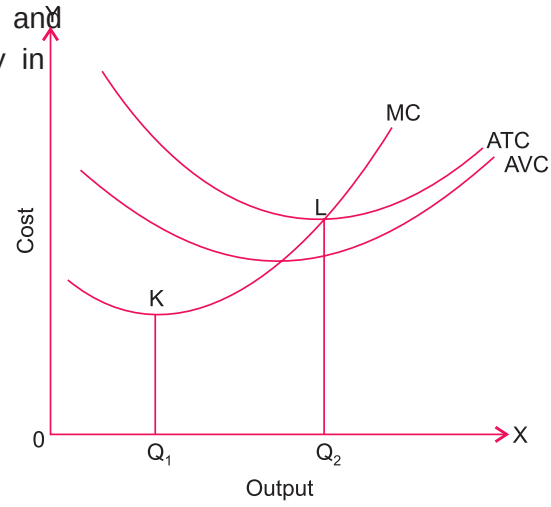


Figure 4.13: Relationship between AC and MC

© MoE, Not to be Ethiopia Published

Some notable points are:

The average variable cost is the total variable cost divided by the total product, whereas marginal cost is the added cost involved for producing one more unit of product.

- When the marginal cost is less than the average cost, the average cost falls with increases in output. It will be seen from Figure 4.13 that, as long as the MC curve lies below the ATC curve (up to OQ_2 amount of output), the ATC curve falls. Note the same relationship exists between the MC curve and the AVC curve.
- When the marginal cost is greater than the average cost, the average cost is rising. In Figure 4.13, the MC curve lies above the ATC curve beyond the OQ_2 level of output, and during this range the ATC curve is rising.
- When marginal cost is equal to average cost, the average cost is minimum. In Figure 4.13, the average cost is minimum for a while at point L on the ATC curve, and the MC curve cuts the ATC curve at this minimum point, showing that the marginal cost equals the average cost.

4.3 RELATIONSHIP BETWEEN PRODUCTION AND COST

At the end of this section, you will be able to:

- show the relationship between production and cost.

Key Terms and Concepts

- Marginal cost
- Marginal product
- Total variable cost
- Average product
- Average cost
- Explicit cost
- Implicit cost

Start-up Activity

State the relationship between cost and production. State the various factor inputs in which a firm requires to expend in the process of production in your locality.

Analyses of production and cost are closely related. We can even say that the cost function is simply the production function expressed in money units. The basic rule that governs this relationship is that when marginal product is increasing, marginal cost is decreasing and vice versa. We illustrate the relationship between production and cost in the short run, through the following table.

Table 4.9: Production and Cost in the Short Run

Units of Variable Input, Labour (L)	Total Product (Q)	Total Variable Cost (L × wage rate of Birr 100)	Marginal Cost (Birr) (TVC/ Q)	Marginal Product (Q/ L)
0	0	0	—	—
1	10	100	10.00	10
2	22	200	8.33	12
3	40	300	5.55	18
4	55	400	6.67	15
5	62	500	14.33	7
6	65	600	33.33	3
7	60	700	(–)20.00	(–)5

The cost of using variable input is determined by multiplying the units of variable input (labour) by its price. The table reveals that the total product (Q) first increases at an increasing rate and later on at a decreasing rate. Correspondingly, the total variable cost (TVC) first increases at a decreasing rate and then at an increasing rate. By plotting the data of the first three columns of Table 4.9, we get Figure 4.14, which reveals that the total variable cost and total product curves are mirror images of each other: points A_1, B_1, C_1, etc. match with points A_2, B_2, C_2, etc.

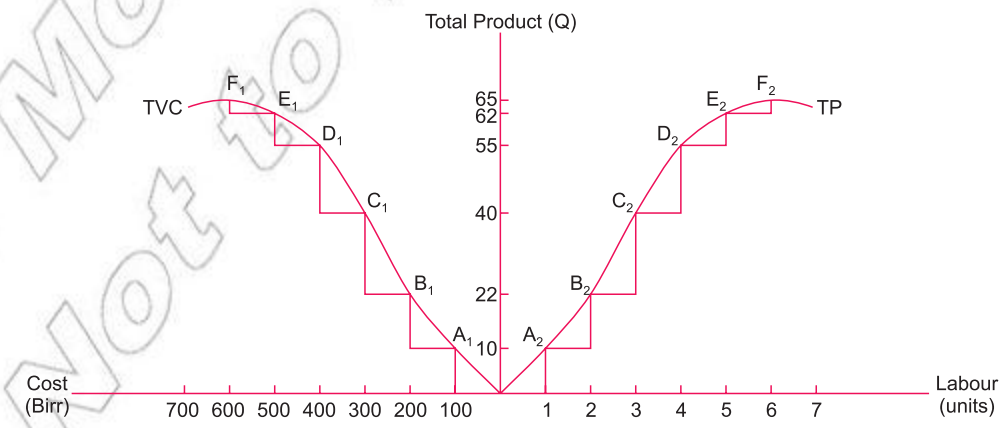


Figure 4.14: Cost and Production Short Run

We may restate the relationship between cost and production (shown in Figure 4.14) in terms of marginal products and marginal cost. Comparison of columns 4 and 5 reveals that when MP is increasing, MC is decreasing, and while MP is decreasing, MC is increasing. MC increases in the ranges where production experiences diminishing returns. Note that just as the TVC and TP curves are mirror images of each other (as shown in Figure 4.14), MC and AVC curves are also mirror images of the MP and AP curves (as shown below).

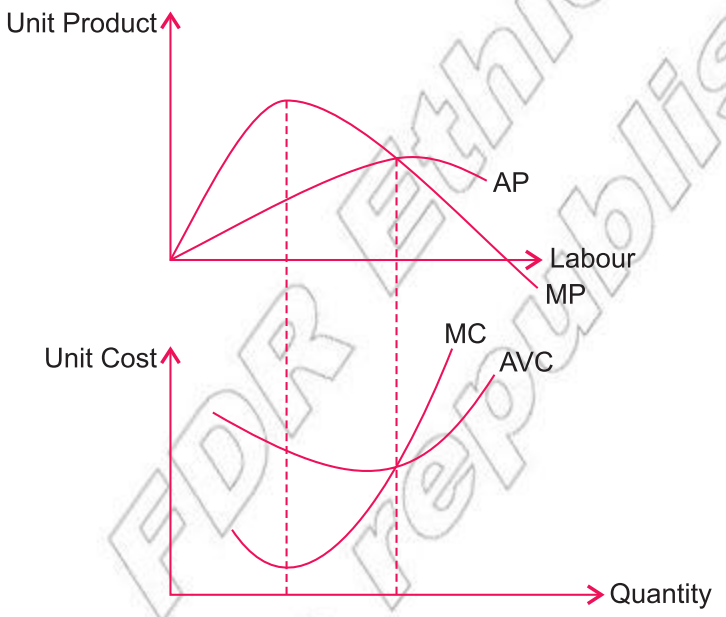


Figure 4.15: Relationship Between Production and Cost

We may conclude that there is an inverse relationship between production and cost.

- TVC and TP of labour are inversely related.
- AVC and AP of labour are inversely related.
- MC and MP of labour are inversely related. Assuming that labour is the variable input and that the wage rate (W) is given, we give below an algebraic proof for the relationship between MC and MP.

û 7 9 & û / î :

6 L Q F H 0 & û 7 9 & û 4

$$MC = \frac{\Delta TVC}{\Delta Q} = \frac{\Delta (L \cdot W)}{\Delta Q} = W \cdot \frac{\Delta L}{\Delta Q} = W \cdot \frac{1}{\Delta Q / \Delta L} = \frac{W}{MP_L} \qquad (4.13)$$

Where, MP_L û 4 û /

Thus, assuming that the wage rate is given, MC and MP move in opposite directions, or are inversely related to each other.

Practical Work

1 Complete the following table:

Output (Units)	Total Cost (birr)	TFC (birr)	TVC (birr)	MC (birr)
0	20			
1	38			
2	50			

Solution:

		TC - TVC = TFC	TC - TFC = TVC	$\frac{\Delta TC}{\Delta Q}$
Output (Units)	Total Cost (birr)	TFC (birr)	TVC (birr)	MC (birr)
0	20	20	0	—
1	38	20	18	38 – 20 = 18
2	50	20	30	50 – 38 = 12

2 The following table shows the total cost of production of a firm at different levels of output. Find out the average variable cost and the marginal cost at each level of output.

Output (Units)	0	1	2	3
Total Cost (birr)	60	100	130	150

Solution:

Output (Units)	TC (birr)	TFC (birr)	TVC =TC – TFC (birr)	AVC =TVC/Q (birr)	MC = ¨TC/¨Q (birr)
0	60	60	0	—	—
1	100	60	40	40	100 – 60 = 40
2	130	60	70	35	130 – 100 = 30
3	150	60	90	30	150 – 130 = 20

3 The following table shows the marginal cost at different levels of output by a firm. Its total fixed costs are Birr 90.

Find its average total cost and average variable cost at each level of output:

Output (Units)	1	2	3
Marginal Cost (birr)	30	20	22

Solution:

Output (Units)	MC (birr)	TVC (birr)	TFC (birr)	TC	ATC	AVC
0	—	0	90	90	—	—
1	30	30	90	120	120	30
2	20	50	90	140	70	25
3	22	72	90	162	54	24

4 If total fixed cost is Birr 60, from the following table calculate total variable cost, total cost, average total cost and marginal cost.

Output (Units)	1	2	3
AVC (birr)	20	15	20

Solution:

Output (Units)	TFC (birr)	AVC (birr)	TVC (birr)	TC (birr)	ATC (birr)	MC (birr)
0	60	—	0	60 + 0 = 60	—	—
1	60	20	20 × 1 = 20	60 + 20 = 80	80 ÷ 1 = 80	80 – 60 = 20
2	60	15	15 × 2 = 30	60 + 30 = 90	90 ÷2 = 45	90 – 80 = 10
3	60	20	20 × 3 = 60	60 + 60 = 120	120 ÷ 3 = 40	120 – 90 = 30

5 From the cost function of a firm given below, find out

i Total fixed cost,
ii Total variable cost,
iii Average variable cost,
iv Marginal cost.

Output (Units)	0	1	2	3	4
Total Cost (birr)	50	70	90	100	110

Solution:

Output (Units)	TC (birr)	TFC (birr)	TVC (birr)	AVC (birr)	MC (birr)
0	50	50	—	—	—
1	70	50	20	20	20
2	90	50	40	20	20
3	100	50	50	16.6	10
4	110	50	60	15	10

© MoE-EIO Ethiopia Not to be republished

Activity 4.4

1 Assume that the MC of a firm is Birr 40 and its AVC is Birr 50. Identify the stage of production in which the firm is operating.

2 Given the cost function of a firm as: $C = 128 - 6Q + 2Q^2$, compute the following:

a TFC

b TVC of producing 4 units

c AVC of producing 4 units

d ATC of producing 4 units

e MC of producing the 4th unit

3 The following data refer to the production department of a firm:

a Number of workers: 1000

b Wage rate per worker: Birr 25

c Cost of raw materials used: Birr 15000

d Rent of factory building: Birr 5000

e Interest paid: Birr 2000

f Expenses for fuel: Birr 2000

g Number of units produced: 700

Compute AVC and AC for the firm.

4 From the data given below, calculate:

a Average fixed cost

b Average variable cost

c Marginal cost

Output (Units)	0	1	2	3	4	5
Total Cost (birr)	30	90	110	120	140	180

5 Cost function of a firm is given below:

Output (Units)	0	1	2	3	4	5	6
Total Cost (birr)	60	80	100	111	116	130	150

Find out the following:

a Total fixed cost

b Total variable cost

c Average fixed cost

d Average variable cost

e Marginal cost

6 Is it correct to say that, when output is zero, total cost equals total variable cost? Discuss with your friends.

7 Is it correct to say that, when output changes, the change in total cost is greater than the change in total variable cost? Discuss in a group.

Long-Run Cost of Production

In the long runs all factors are variable, and thus there are no fixed costs. For the analysis of the long-run cost of production, we use only three types of curves: Long-Run Total Cost Curve (LTC), Long-Run Average Cost Curve (LAC), and Long-Run Marginal Cost Curve (LMC). Here also, LAC and LMC curves are U-shaped, but they are flatter than the short-run cost curves.

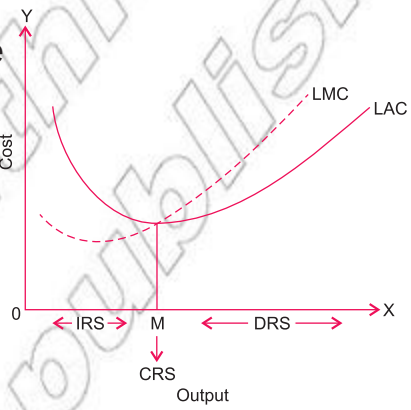


Figure 4.16: Relation Between Production and Cost

Why is the LAC Curve U-shaped?

The U-shape of the LAC curve is because of returns to scale. As we increase the scale of operation in the initial stages, we get increasing returns to scales (IRS) as a result of economies of scale. Increasing returns to scale means that the increase in output is more than proportionate to the increase in factor inputs. Hence the LAC falls as output is increased (in the output range, to M in the diagram). But then, beyond a certain point, we get decreasing returns to scale (DRS) as a result of diseconomies of scale, and hence now LAC rises with increase in output. This happens at output levels higher than M in the diagram. When economies and diseconomies of scale offset each other, it is the stage of constant returns to scale (CRS). It happens at M level of output.

Note that the LMC curve is also U-shaped, for the same reasons, and that it cuts the LAC curve at its minimum point.

The Least Cost Rule

In the long run, cost of a product is the least cost of producing each level of output when all factors of production, including the plant, are variable.

To produce a product at the least cost, the firm should spend its money in such a way that the last Birr spent on each factor of production brings equal marginal product. That is,

$$(MP_L/P_L) = (MP_k/P_k) \quad (4.15)$$

Where, MP_L and MP_k are marginal product of labour and capital, respectively, and P_L and P_k are the price of labour (wages) and price of capital (interest).

Note that the rule is similar to the rule of utility maximisation which we discussed in the previous unit.

Activity 4.5

1 If the price of labour is Birr 20 and price of capital is Birr 100 for a cost-minimising firm, calculate its MP_L given that $MP_K = 50$.

2 In the long run, a firm continues to produce even if it covers only its prime costs (variable costs) – discuss in a group.

© MoE, Ethiopia
Not to be republished

UNIT SUMMARY

- Production function shows the maximum quantity of a commodity that can be produced per unit of time, with given amounts of inputs, when the best production technique is used. The nature of production function depends upon the time period allowed for adjustment of the inputs.
- Short run refers to the period of time in which the amount of some inputs cannot be changed.
- Long run is defined as the time period in which all factors of production can be varied.
- Fixed factors are those factors which remain unchanged at all levels of output.
- Variable factors are those factors whose quantity changes with change in output level.
- Short run production function refers to a situation where we study the change in output when only one input is variable and all other inputs are fixed. In this case, factor proportion is changed. This is the subject matter of the Law of Variable Proportions.
- Long-run production function studies the change in output when all the inputs used in the production of a good are changed simultaneously and in the same proportion. In this case, the scale of production is changed. This is the subject matter of returns to scale.
- Total Product (TP)refers to the total amount of a commodity produced during some period of time by combining different factors of production.
- Average Product (AP) of a variable factor refers to the output per unit of variable factor. Thus,

$$AP_L = \frac{TP_L}{L}$$

- Marginal Product (MP) of a variable factor may be defined as the change in total product resulting from the additional unit of a variable factor.

$$MP_L = \frac{TP_L}{L}$$

- Returns to a factor means change in physical output of a good when the quantity of one factor is increased while the quantity of other factors remains constant.
- Law of Diminishing Marginal Returns states that in all production processes, adding more of one factor of production, while holding one or more of other inputs constant, will at some point yield lower per

unit returns. Diminishing returns occurs in the short run when at list one factor is fixed.

- Three stages of production are:
  - Stage of Increasing Returns characterised by increasing AP, although with MP increasing initially, but falling later. TP increases at an increasing rate at first, and then at a decreasing rate. This stage is explained in terms of fuller utilisation of fixed factors and division of labour.
  - Stage of Diminishing Returns is characterised by both AP and MP decreasing while TP increases at a diminishing rate. This is the actual stage of operation. This stage arises because of disturbances in optimum factor propositions and imperfect substitutability of factors.
  - Stage of Negative Returns is characterised by diminishing TP; AP decreases but remains positive, and MP is negative. This stage is explained in terms of managerial problems.
- Marginal Rate of Technical Substitution (MRTS) . Given two inputs X, and Y, the marginal rate of technical substitution of X for Y represents the amount of X that a firm must add to replace the reduced amount of Y so as to maintain the same amount of output.
- When only two inputs vary, we can use isoquants to find the optimum input combination for the optimum level of output. An isoquant (or, Iso-product, or, equal-product curve) shows the various combinations of the two inputs at a given level of output. The slope of an isoquant is known as marginal rate of technical substitution ($MRTS_{L,k}$) and is equal to the ratio of (MP_L/MP_k).

$$MRTS_{L,K} = \frac{P_L}{P_K}$$

- An isoquant map represents the whole array of isoquants on a graph. Properties of isoquants:
  - downward sloping to the right
  - no two isoquants intersect or touch each other
  - Isoquants are convex to origin.
- Ridge Line. It is the locus of points of isoquants where marginal product of inputs are zero. These lines are used to separate the efficient ranges (with positive slope of isoquants) from the inefficient ranges (with negative slope of isoquants). Thus, ridge lines indicate the boundaries of the efficient ranges of output on the isoquants.
- In an isoquant map, the ridge lines indicate the boundaries of the economic region of production.
- At equilibrium,
  - Returns to Scale. The addition of output that results from an increase in all inputs by some proportion. If the output increases by a greater proportion than the proportion of input increases, the firm

is experiencing increasing returns to scale. If the output increases by the same proportion as the inputs, the firm is experiencing constant returns to scale. Finally, if the output increases by a smaller proportion than the increases in inputs, the firm is experiencing decreasing returns to scale.

- Technological change shifts the production function upward.
- Private cost refers to the cost incurred by an individual firm in producing a commodity.
- Social cost refers to the cost that society has to bear because of the production of a commodity.
- Explicit cost refers to money expenses incurred in purchasing or hiring the factor services.
- Implicit cost refers to the imputed value of the inputs owned by the firm and used by it in its own production.
- Economic cost consists of explicit cost and implicit cost.
- Total fixed cost is the total cost incurred on fixed factors. It does not change with change in output.
- Total variable cost is the total cost incurred on variable factors. It changes with change in output.
- TFC curve is a straight-line curve parallel to the horizontal axis.
- TVC curve is concave downward, up to some level of output, then concave upward.
- TC curve increases at a decreasing rate first and then at an increasing rate.
- AFC is the per-unit cost of the fixed factors.
- AFC curve slopes downward continuously from left to right.
- AVC curve is the per-unit cost of the variable factors.
- AVC curve is U-shaped due to the law of variable proportions.
- ATC (or simply AC) is the per-unit cost of all factors of production used in production.
- ATC curve is the vertical summation of the AVC and AFC curves. It is U-shaped.
- Marginal cost is the addition to total cost as one more unit of output is produced.
- MC curve is U-shaped due to the law of variable proportions.
- The relationship between AC and MC is:
  - when, MC < AC, AC falls;
  - when MC > AC, AC rises;
  - when MC = AC, AC is minimum.
- Long-run cost is the least cost of producing each level of output when all factors of production are variable. To produce a product at the least cost, the firm should spend its money in such a way that the last Birr spent on each factor of production brings equal marginal product.

- There is an inverse relationship between production and cost: TVC and TP are inversely related; AVC and AP are inversely related; MC and MP are inversely related.

REVIEW EXERCISE FOR UNIT 4

I Write detailed answers to the following questions

1 Define production function. Explain two types of production function based on time period of production.

2 Explain the relationship between the average product and the marginal product, with the help of a diagram.

3 Explain the relationship between marginal product and total product, with the help of a diagram.

4 State and explain the law of diminishing marginal returns, with the help of an illustration.

5 Explain the law of variable proportions, with the help of total product and marginal product.

6 Using suitable diagrams, explain the three stages of production when one factor input is variable.

7 What are the reasons for the three phases of the law of variable proportions?

8 Discuss the production function with two variable inputs, using the concept of isoquants.

9 Describe the properties of isoquants, using diagrams.

10 Discuss the following concepts:

   a Economic region of production

   b Marginal rate of technical substitution

11 State and explain returns to scale.

12 Explain the meaning of increasing returns to scale and decreasing returns to scale, with the help of total physical product schedule.

13 Describe the effect of technological change on production function.

14 Explain the relationship between average total cost curve, average variable cost curve, and marginal cost curve.

15 Explain the concept of marginal cost. Does fixed cost affect marginal cost? Give reasons.

16 Explain the relationship between average cost and marginal cost, with the help of an appropriate diagram. Can the average cost rise when the marginal cost is diminishing?

17 Explain the relationship between total cost, average cost, and marginal cost, with the help of a cost schedule.

18 Why is the short-run average cost curve (SAC) U shaped?

19 Explain the shape of the long-run average cost curve (LAC).

20 Discuss the relationship between production and cost.

II Distinguish between the following:

21 Returns to a variable factor and returns to scale

22 Increasing returns to a variable factor and increasing returns to scale

23 Diminishing returns to a variable factor and diminishing returns to scale

24 Fixed costs and variable costs

25 Private cost and social cost

III Write 'True' or 'False' for each of the following:

26 When MP > AP, this means that AP is falling.

27 When MP = AP, this means that AP is minimum.

28 When TP increases at an increasing rate, MP increases.

29 An isoquant is a curve representing the various combinations of two inputs that produce different amounts of output.

30 Higher isoquants represents larger output.

31 MRTS increases as more and more labour is substituted for capital.

32 Technological progress shifts the production function downward.

33 Economic cost is the sum total of explicit cost and implicit cost.

34 In the short run, the AVC curve is U-shaped.

35 Production and cost are directly related to each other in the short run.

IV For each of the following, four choices are given, but only one of them is correct. Choose the correct one.

36 The process of using different factors of production in order to make goods and services available is known as:

A Investment
B Production
C Consumption
D Resource

37 Any good or service that comes out of a production process, is known as:

A Output C Labour

B Input D Economic resource

38 When the short-run average product of labour is declining but positive, the marginal product of labour is:

A Negative C Zero

B Declining D Any of these is possible

39 When the short-run marginal product of labour is greater than the average product of labour:

A AP_L is increasing C AP_L is equal to zero

B AP_L decreasing D None of these

40 When the short-run, MP_L is negative:

A TP is also negative

B TP is declining

C TP is rising at a constant rate

D TP is rising but at a diminishing rate

41 Suppose the average product of 6 workers is 150 units of a good and that of 7 workers is 170 units. The MP of the seventh worker equals:

A 200 B 270 C 290 D 220

V Write very short answers to the following questions

42 What do you call the period in which:

a the scale of plant cannot be altered;

b the scale of plant can be altered?

43 Give two examples of variable factors.

44 Give two examples of fixed factors.

45 When the total physical product of a variable factor reaches its maximum, what will be the marginal physical product?

46 How does marginal physical product behave when total physical product starts to decline?

47 What will be the direction of marginal physical product when total physical product increases at an increasing rate?

48 When marginal physical product declines but it is neither zero nor negative, does total physical product also decline?

49 What will be the total physical product when:
   a marginal physical product rises
   b marginal physical product declines but remains positive
   c marginal physical product is zero
   d marginal physical product is negative

50 In which stage of the law of variable proportions will a producer produce?

51 When total product increases at a decreasing rate, what happens to marginal product?

52 Can average product be zero or negative?

53 Can marginal product be zero or negative?

54 When production increases in the same proportion as the increase in a variable factor, what do you call it?

55 When does scale of operation change?

56 Name the law expressing the relationship between the quantities of a variable factor and the quantities of output.

57 State whether the law of variable proportions operates in the short run or in the long run.

58 How many stages are there in the law of variable proportions?

59 What will be the shape of marginal product curve in the case of diminishing returns to a factor?

60 Give two examples of:
   a explicit costs
   b implicit costs
   c fixed costs
   d variable costs

61 What is the shape of the total fixed-cost curve?

62 When the AC curve is falling, what will be the position of the MC curve?

63 Can the AFC curve touch the X-axis?

64 What does the difference between total cost and total variable cost indicate in the short run?

65 Why are the TC and TVC curves parallel to each other?

66 Why do TC and TFC become equal at the zero level of output?

67 If TFC and TVC are given, how will you estimate the TC?

68 What does the difference between total cost and total fixed cost indicate in the short run?

VI Numericals

69 Study the following table:

Units of labour employed	1	2	3	4	5	6
Total Product (kg.)	10	24	50	75	95	108

Find out:

a The average product when 6 units of labour are employed.
b The marginal product of the 5th unit of labour employed.

70 Complete the following table:

Units of Labour	Total Product (kg.)	Marginal Product (kg.)	Average Product (kg.)
0	—		
1	5		
2	12		
3	21		
4	28		

71 Calculate MC from the information given below:

Output (Units)	1	2	3	4
AVC (Birr)	20	15	25	40

72 From the following data for a firm, find the

a average fixed cost,
b average variable cost and
c marginal cost:

Output (Units)	0	1	2
Total Cost (Birr)	75	95	110

73 Complete the following table:

Output (Units)	Total Cost (Birr)	Total Variable Cost (Birr)	Marginal Cost (Birr)
0	12		
1	18		
2	21		

74 Calculate TFC, TVC, AVC and MC from the following:

Output (Units)	1	2	3
TC (Birr)	20	26	39
AFC (Birr)	6	3	2

75 Total fixed cost is Birr 120, and the marginal costs of different levels of output are given in the following table. Find out total cost, total variable cost, average total cost and average variable cost.

Output (Units)	1	2	3
Marginal Cost (Birr)	40	30	26

76 Calculate average cost and total cost, with the help of the following data:

Output (Units)	1	2	3
Marginal Cost (Birr)	10	8	6

77 From the table given below, calculate TFC, TVC, AFC, AVC, AC and MC.

Quantity Produced (Units)	Total Cost (Birr)
0	40
1	70
2	95
3	130
4	170
5	220

78 Assume the total cost of a producer of a commodity in the short - run is given by the equation:

$$TC = 30{,}000 + 15Q^2 + 5Q$$

where: TC = total cost, Q = level of out put

8 V L Q J W K H J L Y H Q W R W D O F R V W ¿ Q G H T X D W L

a variable costs

b fixed costs

c average variable costs

d average fixed costs

e average costs

f marginal costs

5

Unit Objectives

After completing this unit, you will be able to:

- realize and explain the different market structures and analyze how firms maximize their profits in different markets; and
- state how perfectly competitive, pure monopoly, oligopoly and monopolistically competitive markets maximize their profit.

Main Contents

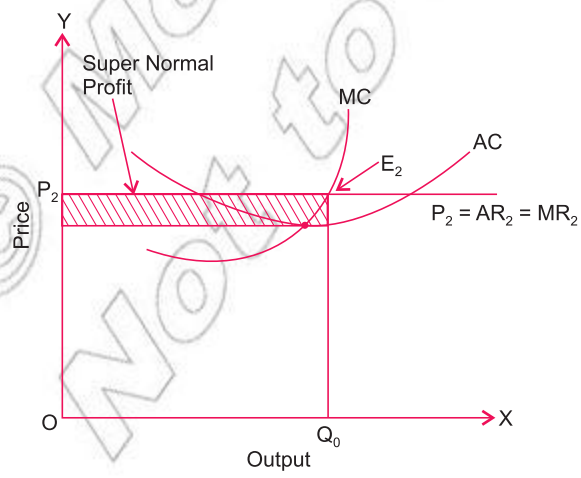
5.1 PERFECTLY COMPETITIVE MARKET

5.2 PURE MONOPOLY

5.3 MONOPOLISTICALLY COMPETITIVE MARKET

5.4 OLIGOPOLY MARKET

- Unit Summary
- Review Exercise



© Not to be republished

INTRODUCTION

In the ordinary sense, the word market refers to a physical place where commodities are bought and sold. In economics, however, the term market does not necessarily refer to a particular place, but to the mechanism or arrangement by which buyers and sellers of a commodity are able to contact each other for having economic exchange and by which they are able to strike deals about price and the quantity to be bought and sold. In simple words, we may define market asa structure in which the buyers and sellers of a commodity remain in contact.

Markets are classified into different types on the basis of factors such as: the degree of competition among firms in a market, the number of buyers and sellers, the nature of the commodity, the mobility of goods and factors of production, and the knowledge of buyers and sellers about prices in the market. The types of market structure are:

- Perfectly competitive market
- Pure monopoly market
- Monopolistically competitive market
- Oligopoly market

In the present unit, we discuss the main features of each type of market and how it works (its profit maximisation process).

5.1 PERFECTLY COMPETITIVE MARKET

At the end of this section, you will be able to:

- define market;
- identify the different types of market structure;
- state the characteristics of a perfectly competitive market;
- compute and interpret the revenue of a perfectly competitive market;
- differentiate total, average, and marginal revenue;
- examine how profit is maximized under the total approach;
- examine how profit is maximized under the marginal approach;
- solve for-profit maximization in the long run and interpret the level of profit; and
- derive the supply curve of a perfectly competitive firm.

Key Terms and Concepts

- Homogeneous product
- Revenue
- Total revenue
- Average revenue
- Marginal revenue

Start-up Activity

Discuss which benefits consumers more:

a presence of a supplier of a commodity or

b presence of several suppliers of a commodity?

A perfectly competitive market or perfect competition is a market structure in which there are a large number of producers (firms) producing a homogeneous product so that no individual firm can influence the price of the commodity. In this type of market, the price is determined by the industry (aggregate of all the firms producing the same product) through the forces of demand and supply. We discuss below the main features which a market must have in order to be perfectly competitive.

Assumptions of Perfectly Competitive Markets

- **Very large number of buyers and sellers:** The number of buyers and sellers is so large that none of them can influence the prevailing price in the market. Each buyer and seller buys or sells a very insignificant proportion of the total supply of the commodity in the market. In fact, the price of the commodity is determined by the aggregate demand and aggregate supply in the whole industry. But once the price is determined by the industry, each firm and buyer has to accept it. A firm is, therefore, a price-taker rather than a price-maker.
- **Homogeneous product:** Products sold in the market are homogeneous – i.e., they are identical in all respects, including quality, colour, size, weight, design, etc. They are perfect substitutes for one another. Since a buyer cannot distinguish between the product of one firm from that of another, he/she becomes indifferent as to the firms from which he/she buys. The product being homogeneous, no seller can charge a higher price.
- **Free entry and exit of firms:** Buyers and sellers are free to enter or leave the market at any time they like. New firms, induced by large profits, can enter the industry, whereas losses cause the inefficient firms leave the industry.

- **Perfect knowledge:** The buyers and sellers have perfect knowledge about the prices and costs prevailing in the different parts of the market. All firms have equal access to knowledge about the market and technology, resulting in same per-unit cost of production. Clearly, this leads to the emergence of uniform price of the product.
- **Perfect mobility:** There is perfect mobility of goods and factors of production without any hindrance or obstruction. The factors are free to enter the industry, if considered profitable, and to leave the industry when remuneration is inadequate.
- **Absence of transport cost:** In perfect competition, it is assumed that there is no transport cost for consumers who may buy from any firm. This ensures the existence of a single uniform price of the product.

  Example: most agricultural product's market.

Distinction Between Perfect Competition and Pure Competition

Sometimes a distinction is made between **perfect competition** and **pure competition**, but the difference is only a matter of degree.

Competition is said to be pure when the first three conditions explained above are satisfied. It means that pure competition exists when there is a very large number of buyers and sellers who deal in a homogeneous product and when the industry is characterised by free entry and exit. In contrast, competition is said to be perfect when all six of the conditions explained above are satisfied.

Revenue of a Perfectly Competitive Market

Before we discuss revenue of a perfectly competitive market in detail, we explain below some of the basic relevant concepts.

i **Revenue:** The revenues of a firm are the receipts that it obtains from selling its products. Hence, the curve depicting the amounts of revenue that it receives by selling the various quantities of a commodity is called the revenue curve.

Similar to costs, revenues have three main categories: **Total Revenue (TR)**, **Average Revenue (AR)** and **Marginal Revenue (MR)**.

ii **Total, Average and Marginal Revenue:**

a **Total Revenue (TR):** Total Revenue refers to the total amount of money that the firm receives from the sale of a given amount of its output.

Total revenue can be estimated by multiplying the quantity sold by its selling price,

$$TR = P \times Q \qquad (5.1)$$

Where; P is the price per unit, and Q is the quantity of output sold.

b Average Revenue (AR): Average Revenue is the total revenue (TR) divided by the quantity sold (Q), or it is the per-unit revenue

$$AR = \frac{TR}{Q} = \frac{P \text{ u } Q}{Q} = P \qquad (5.2)$$

Note that average revenue (AR) and price of the product (P) have the same meaning. Average revenue means per unit revenue received by the seller from the sale of the commodity. On the other hand, price means per unit payment made by the purchaser to purchase the commodity. Since the seller receives what the purchaser pays, the per unit revenue and per unit price are the same. That is why, the AR curve and Demand curve for a firm's product are also the same.

c Marginal Revenue (MR): Marginal revenue is the change in total revenue resulting from one unit increase in the sales

Would you please apply derivative? $MR = \frac{'TR}{'Q}$

$$MR = \frac{'TR}{'Q} \quad \frac{P \ Q}{' \ Q} = P \qquad (5.3)$$

Marginal revenue can also be estimated as the change in total revenue with the sale of n units of a product instead of n – 1 units. Thus,

$$MR = TR_n - TR_{n-1}$$

TR, AR and MR under Perfect Competition

In perfect competition, a firm can sell any amount of output at a given market price. It means that a firm's additional revenue (MR) from the sale of every additional unit of the commodity is just equal to the market price (P) or (AR). Hence, average revenue and marginal revenue become equal and constant in the given situation. Consequently, the AR and MR curves are the same and would be horizontal or parallel to the X-axis. This is also called the price line.

Assuming that price per unit of a commodity is Birr 5, the behaviour of and relationship between TR, MR and AR of a firm under perfect competition, are shown in the following schedule.

© MoE-FDRE Ethiopia Not to be republished

Table 5.1: TR, MR and AR under Perfect Competition

Units of a Commodity	TR (birr)	MR (birr)	AR or Price (birr)
0	0	0	0
1	5	5	5
2	10	5	5
3	15	5	5
4	20	5	5
5	25	5	5

On the basis of the above schedule, we can draw the TR curve and AR = MR curve or price line of a firm under perfect competition as follows. The TR curve under perfect competition passes through the origin because, at zero output, total revenue is also zero. Moreover, TR under perfect competition is a straight line. This is because the market price remains constant.

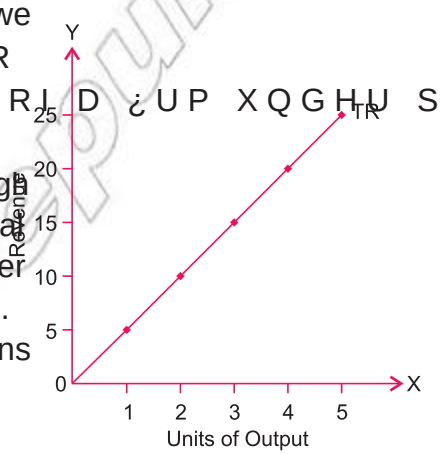


Figure 5.1: Total Revenue Curve

In a perfectly competitive market structure, average revenue (AR) and marginal revenue (MR) are both equal to market price.

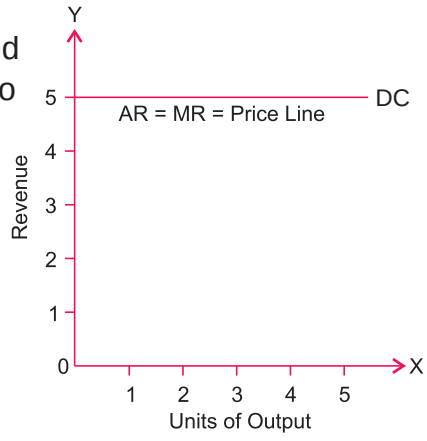


Figure 5.2: AR = MR Curve or Price Line

© MoE, FDRE, Ethiopia Not to be republished

Profit Maximisation or Producer's Equilibrium in the Short Run

Economic theory assumes that the goal of a competitive firm is profit maximisation. Hence, the most important question for a firm is to determine its level of output in such a way as to obtain maximum profit. This level is known as the state of equilibrium. A firm is said to be in equilibrium at that level of output at which it earns maximum profits and shows no tendency either to expand or contract its output.

There are two approaches to finding out the level of output at which a competitive firm maximizes its profit. They are:

- Total Approach (TR and TC approach)
- Marginal Approach (MR and MC approach)

Remember that the total profit of a firm is the excess of total revenue (TR) over total cost (TC), that is,

Total Profit = TR – TC

Total Approach with Graphical Analysis

i Total Revenue and Total Cost Approach: A firm is in equilibrium at that level of its output where the difference between TR and TC is maximum.

Mathematically, profit is maximum when TR – TC is maximum.

$ O V R 7 5 ! 7 & : 3 U R I L W

7 5 7 & : 1 H L W K H U S U R I L W Q R U O R V V

7 5 7 & : / R V V

Graphically this is shown in Figure 5.3.

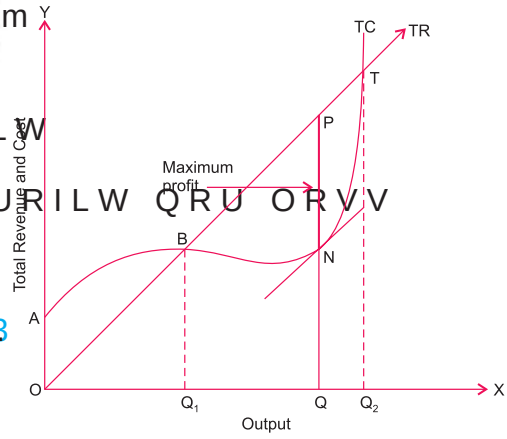


Figure 5.3: TR/TC Approach for Profit Maximisation

In Figure 5.3, above, the TR curve starts from origin O which shows zero revenue when no output is produced. Since TR increases at a constant rate because, under perfect competition, price remains constant irrespective of the firm's level of output. The TR curve is a straight line from the origin.

© MoE, FDRE Ethiopia Not to be republished

On the other hand, the TC curve starts from A, indicating OA as the fixed cost which must be incurred even when output is zero. In the initial stages, TC is greater than TR, indicating the situation of loss, but when it produces level OQ_1 of output, TR just equals TC. This is called **break-even point**. As the firm increases its level of output beyond OQ_1, TR becomes greater than TC signalling the emergence of profit. With every further increase in level of output, the distance between the TR curve and the TC curve widens. At the OQ level of output, the vertical distance PN between the TR curve and the TC curve is at its largest. This should be clear from the fact that the tangent at N is parallel to the TR line. If the firm still continues producing beyond the OQ level of output, the total profit starts to decline. Clearly, total profit will fall if the firm produces more or less than the OQ level of output. Hence the competitive firm will produce at the OQ level of output, where the difference between TR and TC (i.e., total profit) is maximum.

Since profit is the difference between total revenue and total cost, therefore, profit at any level of output is given by the gap between the two curves of TR and TC. Thus, from the TR and TC curves of a firm, it is possible to find out the level of output which gives the firm maximum profit. This output level is called **optimal output**

Marginal Approach with Graphical Analysis

ii Marginal Revenue and Marginal Cost Approach: In general a firm's profit maximizing condition is MR = MC and MC is rising. But for a competitive firm, this condition is expressed as:

P = MC (because in perfect competition, price = AR = MR)

Graphically a competitive firm's profit is maximized at the point where the price line intersects the MC curve, which is where Price = Marginal Cost (as shown in Figure 5.4).

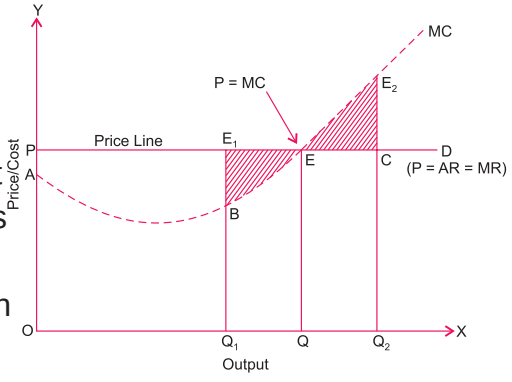


Figure 5.4: 05 0& $SSURDFK IRU 3UR¿W 0D[LP

Remember, in perfect competition, the firm has a horizontal (parallel to X-axis) price line. In the figure above, PD is the price line faced by the firm and the area under the price line shows total revenue. Marginal cost is denoted by the MC curve, and the area under the MC curve shows total cost.

In such a situation, it is at the OQ level of output that the firm's profit is maximised. This is because its price line intersects MC curve at point E where price (reflected by OP) and marginal cost (reflected by EQ) are equal. Thus OQ is the optimal level of output as proved below.

Total Profit = Total Revenue – Total Cost (5.5)

Profit = POQE (area under price line, i.e., total revenue) – AOQE (area under MC curve, i.e., total cost) = PAE. Now, total profit will fall if the firm produces more or less than the OQ level of output. You may ask How? Suppose the firm produces less, say OQ_1 level of output. Then by similar calculation, Total Profit = $PQ_1BE_1 - AOQ_1B = PABE_1$. This profit is less than the profit of PAE shown by the BE_1E shaded area. It shows that the firm can increase profit by producing the additional output Q_1Q and can thus maximise its profit. Now suppose the firm produces more, say the level of output OQ_2. Then, by a similar calculation, Total Profit = $PQ_2CE_2 - AOQ_2E_2$. This is less than the profit of PAE shown by the ECE_2 shaded area. This means losses to the firm because marginal cost exceeds price (or marginal revenue). The firm will, therefore, not produce beyond OQ. Any deviation from the OQ level of output causes a fall in total profit. Hence, the total profit of the firm is maximised at the OQ level of output, where P = MC.

Note that the price line can intersect the MC curve at two points, i.e., falling MC curve and rising MC curve. The profit-maximizing condition of P = MC holds time only the when price line cuts the rising MC curve. MC must be higher than MR after equilibrium condition. Hence to achieve equilibrium, a competitive firm chooses its level of output in the rising portion of the MC curve. Thus, we may conclude, a competitive firm maximizes its profit when

MR = MC, and MC is rising (5.6)

Profit Maximisation in the Long Run

Normal Economic Profit:

In economics, if a firm covers all the economic costs of production — that is, if it covers the opportunity cost of all the resources used in production, it is said to earn normal profit (or zero profit).

© NCERT not to be republished

A firm under perfect competition will be in equilibrium (state of profit maximisation) in the long run when it earns only normal profits. The key to long-run equilibrium is free entry and free exit of firms in the industry. If the existing firms are making abnormal profits in the short run, new firms will be entering the industry to earn these abnormal profits. The total supply of the industry will increase. As a result, the equilibrium price will fall. As the price falls, so will abnormal profits. This entry of new firms will continue until increased supply has driven down the market price sufficiently to eliminate all abnormal profits and so that all the firms in the industry earn only normal profits, i.e., just covering their total costs. On the other hand, if the existing firms are incurring losses in the short run, some of the firms will exist from the industry in the long run. As the firms withdraw, the supply of the industry decreases and the market price rises. Firms will continue to withdraw and price will continue to rise until the remaining firms in the industry are covering all their costs, i.e., earning only normal profits. So, in the long run, a firm under perfect competition can neither have abnormal profits nor losses — it earns only normal profits.

Thus, the long-run profit maximisation condition for a perfectly competitive firm is:

- P = (AR) = LAC (i.e., normal profits)
- MC = MR (profit-maximisation rule), and also that the LMC curve cuts the MR curve from below.

Since, under perfect competition, AR = MR, we can write the equilibrium condition (by equating, 1 and 2) as: in the following:

0 & 0 5 $ 5 / $ & R U 3 / 0 & / $ & (5.7)

In other words, full equilibrium implies equality between all the four relevant
Y D U L D E O H V 0 & / $ & 0 5 D Q G $ 5 F D Q E H H T X D O
R I W D Q J H Q F \ R I W K H S U L F H O L Q H Z L W K W K H / $
P L Q L P X P S R L Q W R Q W K H / $ & F X U Y H L Y W K H
optimum point of production and the output produced at that point is the optimum output

The long-run equilibrium of the firm is illustrated in Figure 5.5 below.
7 K H H T X L O L E U L X P L V D W (Z K H U H W K H / 0 & F X U Y
E H O R Z $ W (E R W K W K H F R Q G L W L R Q V R I O R Q J U
MC = MR – are satisfied.

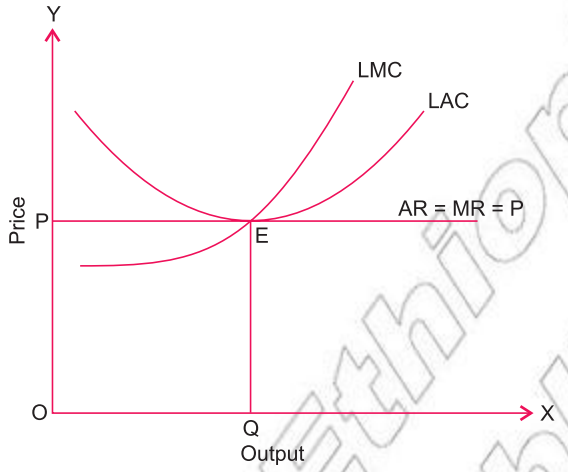


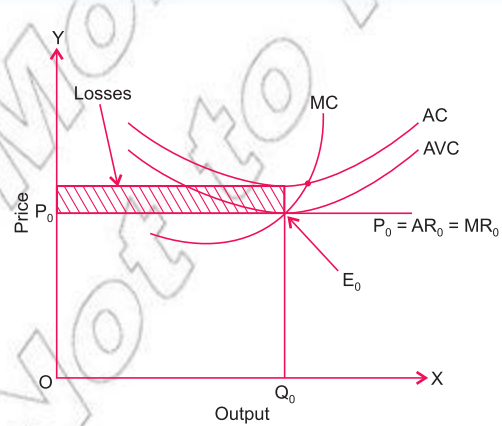
Figure 5.5: Profit Maximisation in the Long Run

Deriving the Supply Curve of a Perfectly Competitive Firm (in the Short Run)

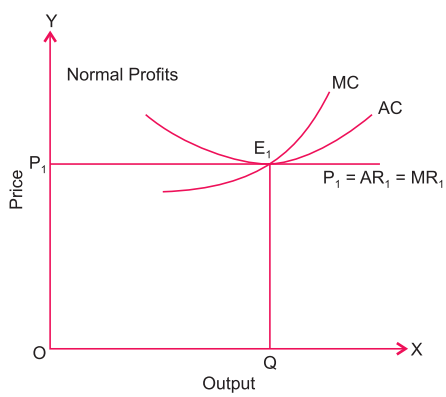
The supply curve of a firm shows what various quantities of a commodity the firm is willing and able to supply at different prices. The quantity which a perfectly competitive firm is willing to supply at a particular price (i.e., equilibrium output) is determined by the equality of MC and MR = AR = P.

The following figures show the equilibrium output at different prices, when a firm

- faces losses
- earns normal profits and
- earns abnormal profits.

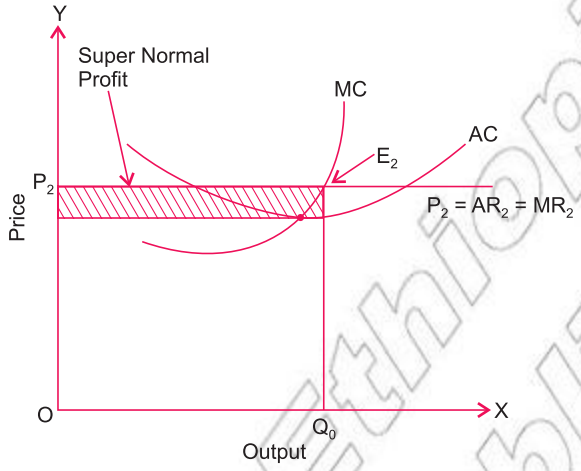


i Losses



ii Normal Profits

© MoE FDRE Ethiopia Not to be republished



iii Abnormal Profits

Figure 5.6: Equilibrium Position of a Firm in Perfect Competition (in the Short Run)

By finding out the equilibrium output at different prices and by joining the different equilibrium points, we can derive the supply curve of the firm (as shown below).

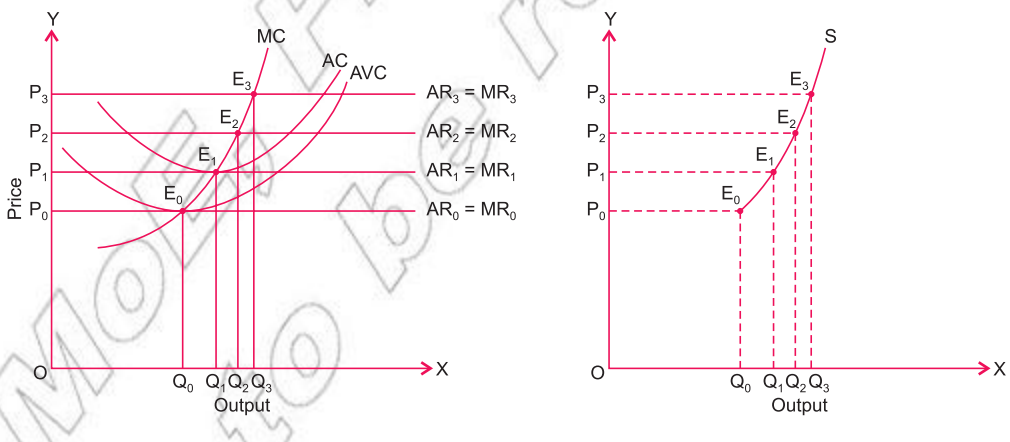


Figure 5.7: Derivation of the Short-Run Supply Curve of a Perfectly Competitive Firm

At P_0 price ($P_0 = AR_0 = MR_0$), MC curve cuts MR_0 from below at E_0, giving E_0 as the equilibrium point and OQ_0 as the equilibrium quantity. At P_0 price, the firm is able to cover only variable costs since P = AVC. Below P_0 price nothing would be produced since P < AVC. E_0 is known as the shut-down point because the firm would not like to operate below this. Now, if the price rises to P_1, the equilibrium point shifts to E_1 where

© MoE FDR Ethiopia Not to be republished

MC = MR_1, and AR_1 > AVC, and the equilibrium quantity increases to Q_1. Point E_1, where the MC curve cuts the minimum point of AC, is known as the break-even point because the firm is able to cover all the costs of production. Similarly, at P_2 and P_3 prices, equilibrium is at E_2 and E_3 respectively, and the quantity supplied is OQ_2 and OQ_3 respectively. While producing OQ_2 and OQ_3 quantities of output, the firm is earning super-normal profits since AR > AC. By joining E_0, E_1, E_2 and E_3, we get the firm's supply curve.

We may conclude that part of the MC curve which lies above the minimum point of the AVC curve is the supply curve of the perfectly competitive firm in the short run.

Note

In the long run, all costs have to be covered, and hence the long-run supply curve is the MC curve above the intersection with the ATC curve.

Practical Work

1 For a perfectly competitive firm, the following information is given:

TFC = Birr 10,000; AVC = Birr 40; AR = Birr 60

Find the quantity produced by the firm at the break-even point.

Solution:

Given: TFC = 10,000, AVC = 40, and AR = 60 at break-even point,

$$P = AR = ATC = AFC + AVC$$

$$\therefore \quad 60 = AFC + 40$$

$$\text{or} \quad 60 = \frac{TFC}{Q} + 40$$

$$\text{or} \quad \frac{TFC}{Q} = 60 \quad 40 = 20$$

$$\therefore \frac{10,000}{Q} = 20$$

$$Q = \frac{10,000}{20} = 500 \text{ units}$$

2 Suppose, for a perfectly competitive firm, marginal cost function is given by:

$$MC = Q^2 - 2Q + 20$$

Find the quantity produced (Q) at the equilibrium level of output, if price per unit of good produced is Birr 44.

Solution:

At equilibrium level of output, P = MC = MR

Ÿ $44 = Q^2 - 2Q + 20$

Ÿ $Q^2 - 2Q - 24 = 0$

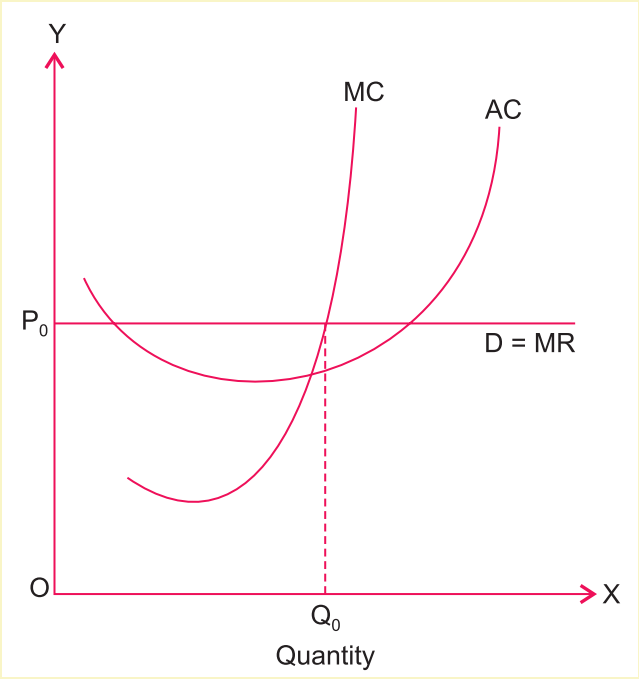
Ÿ $(Q - 6)(Q + 4) = 0$

Ÿ $Q = 6$ or $Q = -4$

Neglecting the negative value of the quantity produced, we get Q = 6, which is the output at equilibrium level. (Here you must be able to apply calculus).

Activity 5.1

1 Does the following figure show a perfectly competitive firm breaking-even in the short run or making profit in the short run?



2 A perfectly competitive firm is operating at a particular level of output with the following information:

Output price = Marginal cost = Average cost = Birr 10

Is the firm maximising its profit or is it facing a situation where it should shut down?

3 A perfectly competitive firm produces 100 units of a good and the market price per unit of good is Birr 18. If the given firm is known to earn a normal profit of Birr 6 per unit, how much is the firm's total cost of production at this level?

4 Using the information given below for a perfectly competitive firm, can you calculate its total profit at the profit maximising level of output?

$TC = Q^3 - 7Q^2 + Q + 12$

$TR = 5Q$

$MC = 3Q^2 - 14Q + 1$

5 Discuss in a group – under perfect competition, industry is the price maker and the firm is the price taker

5.2 PURE MONOPOLY

At the end of this section, you will be able to:

- indicate the characteristics of pure monopoly;
- analyze the reasons for the existence of pure monopoly;
- evaluate loss minimization under pure monopoly; and
- Calculate profit maximization under pure monopoly, using the total approach and the marginal approach.

Key Terms and Concpets

- Monopoly
- Profit maximization
- Price discrimination

Start-up Activity

1 Define monopolistic competition. Explain the main futures of monopolistic competition.

2 State the main reasons for the existence of monopoly.

When any one of the necessary conditions of a perfectly competitive market is violated, the competition becomes imperfect, and the market is said to be an imperfect market. Monopoly is one of the major types of imperfect markets. The term monopoly is derived from the two Greek words, viz, 'Monos' and 'polus'. 'Monos' means single, and 'polus' means a seller. Thus, monopoly is a market structure in which there exists only a single seller of a product, who is the sole producer of the product, and that product has no close substitutes.

It is difficult to find a pure monopoly. However there is only one firm producing and supplying electric power in Ethiopia and this can be considered one example of monopoly.

Assumptions (Features) of Monopoly

The following are assumed to be the features of a monopoly.

- Single Producer: There is a single firm producing the commodity in the market. Since there is a single firm, the difference between firm and industry vanishes.
- No Close Substitutes: For the monopoly to exist, a single producer is the necessary condition but not a sufficient one. It is also essential that there is no close substitute for the commodity in the market.
- Barriers to the Entry: Entry into the industry is completely banned or otherwise made impossible. If new firms are admitted into the industry, the condition of monopoly breaks down. This ban on entry may be legal, natural or institutional, but it must essentially be there.
- Independent Price Policy: A monopolist firm can adopt an independent price policy— i.e., it can increase or decrease prices as it likes. It is in this sense that a seller under monopoly is said to be the price maker or price setter.
- Price Discrimination is Possible: Under the conditions of monopoly, price discrimination is possible. It implies that a monopolist can sell its product at different prices to different customers.

In short, monopoly depends basically on two factors:

- absence of close substitutes; and
- restriction on competition.

Example: Electricity market in Ethiopia and Ethio Telecom.

Reasons for the Existence of Pure Monopoly

The origin and existence of a monopoly may be legal or technological or both. Following are the main causes that lead to a monopoly situation:

- Patent rights for the products or production processes give legal monopoly rights to firms;
- Government policies such as related to granting licences or imposing foreign trade restrictions (like quotas, etc.) result in limiting the number of sellers;

- Ownership and control of some strategic raw materials;
- Exclusive knowledge of technology by the firm;
- It may be that the size of market can accommodate only a single firm. The technology might be such that only a large output can reap the economies of scale. In such a case, the existence of more firms would mean that none of the firms would be able to exploit the economies. In other words, it would lead to unnecessary duplication of facilities. A monopoly that results from such conditions is known as a 'natural monopoly'. Examples falling in this category include railways, telephone firms, natural gas companies and electricity undertakings. Generally, a government undertakes the production of commodities of 'natural monopolies' itself so as to avoid exploitation of the consumers.

Profit Maximisation Under Pure Monopoly

In this section, profit maximisation or a firm's equilibrium determination under monopoly is based on the following assumptions:

- The monopolist does not charge discriminating prices (but in reality the monopolist charges different prices)
- The monopolist is rational in the sense that she/he aims at maximising profits.
- The individual buyer is a price-taker,
- There are no restrictions on the monopolist with regard to her/his price. Also, there is no threat of entry by other firms into the industry.

Given these assumptions, the equilibrium of a monopolistic firm is determined by the forces of demand and supply. The monopolist can control both the prices and the supply of the product. But at any point of time she/he can fix only one of them. Either she/he can fix the quantity of output and let the market determine the price of the product on the basis of market demand; or she/he can fix the price of the product and let market demand determine the quantity which she/he can sell at the given price.

In order to determine the profit-maximisation output of a monopolist, we need to combine the monopolist's revenue curves and cost curves and apply the profit-maximisation rules. As far as cost curves are concerned, they have the same U-shape for the monopolist as for a competitive firm because they depict technological conditions, which are common to all types of market structures. Similarly, profit-maximisation rules are the same in all market structures

because producers in all the markets operate with the objective of earning profits. The difference lies in the demand conditions or the revenue curves. While a firm under perfect competition faces a perfectly elastic demand curve, a monopolist faces a negatively sloping demand curve or average revenue curve. We can show a monopoly with the help of the following example and the corresponding diagram.

Table 5.2: TR, MR, and AR under Monopoly

Units of Output	TR (birr)	MR (birr)	AR (birr)
1	10	10	10
2	18	8	9
3	24	6	8
4	28	4	7
5	30	2	6
6	30	0	5
7	28	–2	4
8	24	–4	3

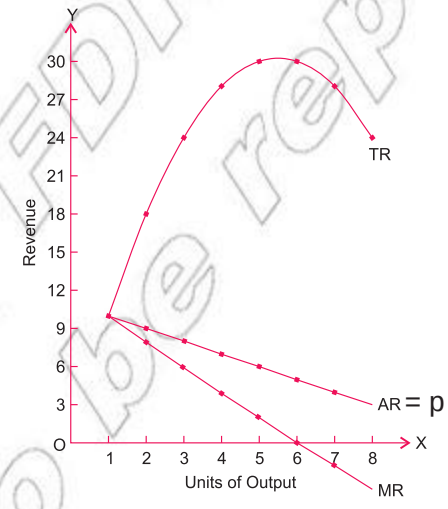


Figure 5.8: TR, MR, AR Curves Under Monopoly

Remarks:

- Both AR and MR are falling, and MR falls at a greater rate than AR. In other words, the AR and MR curves are downward sloping curves, and the MR curve always remains below the AR curve.
- MR can be negative, but AR is always positive. In other words, the MR curve can go below the X-axis, but the AR curve always remains above the X-axis.

© MoE, FDRE Ethiopia not to be republished

Profit Maximisation

The profit of a monopoly firm is maximum at the level of output at which MR = MC and MC is rising.

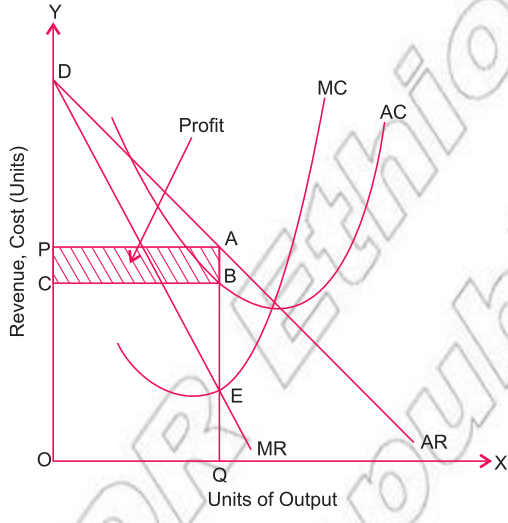


Figure 5.9: Maximisation Under Monopoly

In the beginning, when level of output is very low, MR is greater than MC. Therefore, it is profitable for the firm to increase its output. But with the expansion of output, cost goes on rising, and a stage comes when MC becomes higher than MR, or MR even becomes negative. In such cases, if the firm reduces its output, its savings in cost will be more than the loss in revenue, leading to an increase in total profit. Hence the profit of a monopoly firm is maximum at the level of output where MR = MC (and MC is rising). Thus, to maximise profit, a monopoly firm should produce and sell up to the point at which revenue from the last unit is equal to the cost of last unit.

Thus, we may conclude, a monopolist firm maximizes its profit when

MR = MC, and MC is rising (5. 7)

Note:

Profit maximisation under monopoly conditions can also be explained by using the total revenue and total cost approach, just as we did in the case of the perfectly competitive market.

© MoEF Ethiopia Not to be republished

Mathematically, profit is maximum when TR – TC is maximum (TR > TC).

Graphically, this is shown as in the following diagram.

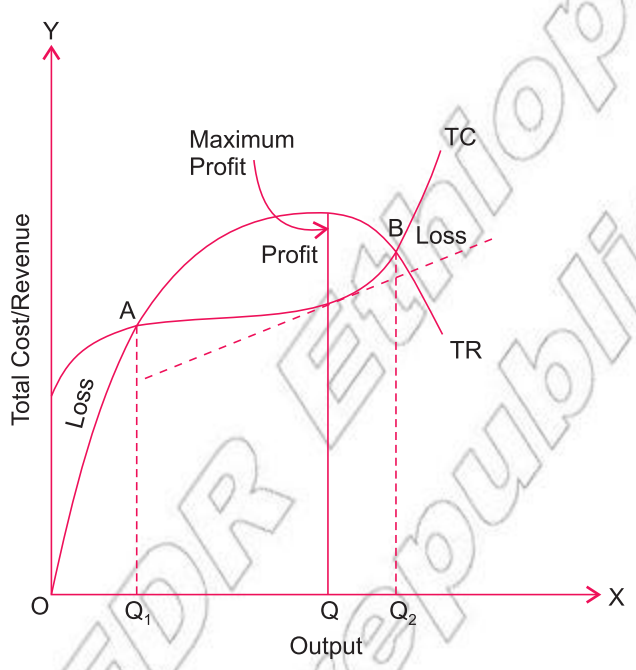


Figure 5.10: TR/TC Approach for Profit Maximisation under Monopoly

Practical Work

1 For a monopolist firm, the following information is given:

MR = 100 – 7Q and MC = 30

Calculate its profit-maximising level of output, or loss minimization

Solution:

For profit maximisation,

MR = MC

Ÿ 100 – 7 Q = 30

Ÿ 7 Q = 100 – 30 = 70

? Q = 10 units is the profit maximising level of output.

© MoE-FDR Ethiopia Not to be republished

2 Given below are the cost and revenue functions of a monopolistic firm:

$TC = 20 + 10Q$

$TR = 40Q - 5Q^2$

$MC = 10$

$MR = 40 - 10Q$

Calculate:

i Profit-maximising level of output

ii Total profit

Solution:

i For profit maximisation,

$MR = MC$

$\therefore \quad 40 - 10Q = 10$

$\therefore \quad 10Q = 40 - 10 = 30$

$\therefore \quad Q = 3$ is the profit-maximising level of output.

ii Total profit $= TR - TC$

$= 40Q - 5Q^2 - (20 + 10Q)$

$= 40Q - 5Q^2 - 20 - 10Q$

$= 40 \times 3 - 5 \times 3 \times 3 - 20 - 10 \times 3 \quad (Q = 3)$

$= 120 - 45 - 20 - 30$

$= 25$ units (you should be able to apply calculus)

Activity 5.2

1 A monopolist is currently producing at an output level where MR = Birr 40 and MC = Birr 30. What do you think he/she should do in order to achieve the output level of profit maximisation?

2 The demand curve for a monopolist is given by $P = 80 - 5Q$, where P is price (in Birr) and Q is quantity demanded. Find out his/her total revenue when quantity demanded is 4 units.

3 Identify the market form for the two sellers of goods A and B, given the following information.

© FDRE Ethiopia Not to be republished

Output Sold (Units)	Price of a (birr)	Price of b (birr)
10	5	5
20	5	4
30	5	3

4 'Monopoly is not a permanent phenomenon' – Discuss in a group and note down the outcomes of your discussion.

5.3 MONOPOLISTICALLY COMPETITIVE MARKET

At the end of this section, you will be able to:

- identify the characteristics of monopolistically competitive firms; and
- compute profit maximization under a monopolistically competitive market.

Key Terms and Concepts

- Break-even point
- Selling cost
- Normal profit

Start-up Activity

List down firms in Ethiopia which are exclusively and safely supplying a commodity or service. What are advantages and disadvantages of presence of such firms in a market?

Perfect competition and pure monopoly are two extreme market situations which are not found in real life. The actual market situations are somewhere between these two. It is a market situation with some elements of competition and some elements of monopoly, and thus termed as monopolistic competition (or imperfect competition).

Monopolistic competition refers to a situation where there are many sellers of a differentiated product. There is competition which is keen, though not perfect, between many firms making very similar products, which are close but not perfect substitutes Since the products are differentiated, each seller can independently decide his/her own price-output policies.

Characteristics of a Monopolistically Competitive Market

The major characteristics of a monopolistically competitive market are the following:

- Many Sellers: The sellers are "many and small enough". They are many in number and no seller is big enough to influence the market price, which is determined by industry demand and supply. Thus, there is no significant interdependence between sellers. Each seller pursues an independent output-price policy.
- Product Differentiation: another main feature of monopolistic competition is product differentiation. There are many firms producing a particular product, but each firm introduces its product as different from others. The basis of this differentiation may take the form of quality difference, advertisement, patent rights, trademarks, etc. The differentiation makes the products of different firms heterogeneous; but these products are close substitutes of each other.
- Free Entry and Exit of Firms: New firms can enter the market if they find it profitable. Similarly, inefficient firms already operating in the market are free to quit if they incur losses. Because of this feature, monopolistic competition also gives rise to normal profit in the long run, just like perfect competition.
- Selling Cost: An important characteristic of monopolistic competition is that firms under monopolistic competition compete with each other by incurring selling costs or expenditures for sales promotion. Selling cost is the expenditure incurred by the firm to promote the sale of its product through various sales promotion measures. The sales promotion measures may take the form of persuasive or competitive advertisement like advertisement in newspapers, T.V. commercials, etc.
- Non-Price Competition: Non-price competition is an essential part of monopolistic competition. Firms under monopolistic competition compete with each other not merely by price-cutting, but also on the basis of non-price competition, i.e., producing differentiated products, incurring advertisement expenditure, etc.
- Independent Price Policy: A firm under monopolistic competition can follow an independent price policy. It can influence the price of the

commodity to some extent. This means that a firm under monopolistic competition is a price-maker for its product.

From the analysis of the characteristics of monopolistic competition, one can clearly understand that monopolistic competition is a realistic model of market structure. Most consumer goods, like textiles, clothing, food products, goods of common use (like toothpaste, soap, blades, pens), electronics, etc., are all produced with different brand names and hence come under this type of market structure.

Example:Hotel, Barber shops ...

Profit Maximisation Under Monopolistically Competitive Markets

The conditions for profit maximisation under monopolistic competition are the same as in the case of perfect competition and monopoly. Here also we determine profit maximising output by combining the cost curves (which are, as usual, U-shaped) with demand curves. Note that both monopolistic firms and monopolistically competitive firms have downward sloping demand curves for their products. Yet there is an important difference between the two. The demand curve of a firm under monopolistic competition is flatter or more price-elastic than that of a monopolistic firm. This is because under monopolistic competition there are a number of close substitutes available for the firm's product, while under monopoly there are no such close substitutes available for the product.

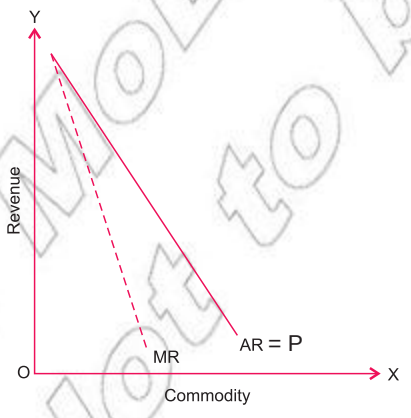


Figure 5.11: Monopoly

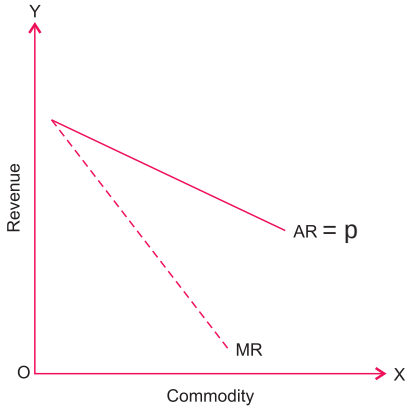


Figure 5.12: Monopolistic Competition

The profit of a monopolistic competitive firm is maximum at the level of output at which MR = MC and MC is rising

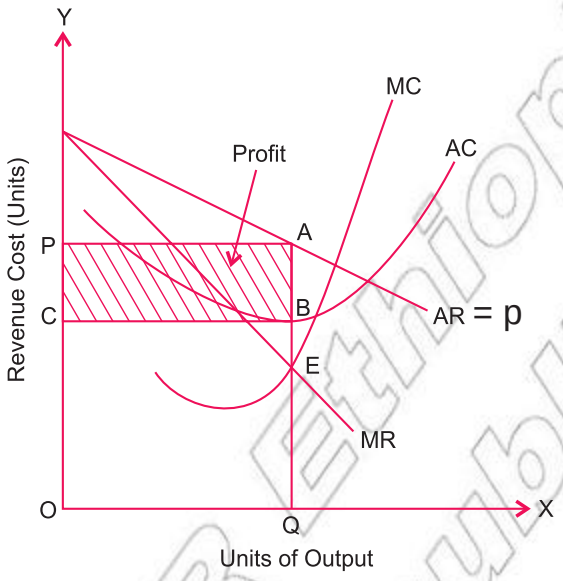


Figure 5.13: Profit Maximisation in Monopolistically Competitive Markets

Note that in monopolistic competition there is free entry and exit of firms in the long run which means that, if firms are earning super-normal profits, new firms enter, and this gives rise to normal profits.

Hence the condition for profit maximisation in the long run is:

0 5 /0& /0& L V U L V L Q J D Q G (5.3) R U $5 /$&

Activity 5.3

1 Identify three major differences between the characteristic features of pure-monopoly and monopolistically competitive markets.

2 Present a comparative view of the demand curves in perfect competition, monopoly, and monopolistic competition through separate diagrams as well as a collective diagram drawn on chart paper.

3 Differentiate diagrammatically the AR curves for different market forms – perfect competition, monopoly, and monopolistic competition.

4 Compare the relationship between price and marginal cost of a firm under perfect competition, monopoly, and monopolistic competition.

© FDRE Ethiopia Not to be republished

5.4 OLIGOPOLY MARKET

At the end of this section, you will be able to:

- understand how different firms in an oligopoly market may coordinate with each other.

Key Terms and Concepts

- Cartel
- Price leadership
- Conscious parallelism

Start-up Activity

Discuss the possibility of national economic development in the presence of an oligopolystic market. Take the current situation of Ethiopia as a case study.

Oligopoly is a market situation where a few large firms compete against each other and there is an element of interdependence in the decision-making of these firms. Each firm in the oligopoly recognizes this interdependence. Any decision one firm makes (be it about price, product or promotion) will affect the trade of the competitors and so results in countermoves.

Characteristics of Oligopoly Markets

Oligopoly markets have the following characteristics:

- Number of Sellers: The number of sellers is small, and each seller is catering to a significant part of the market demand. Due to the extent of the influence of each seller, their policies have a noticeable impact on the production and pricing decisions in the market.
- Interdependence: An oligopolist firm is not independent in making decisions. It has to take into consideration the actions and reactions of its rivals (competitors).
- Nature of the Product: The firms under oligopoly may produce homogeneous products or differentiated products. Accordingly, we may have “oligopoly without product differentiation” (or pure oligopoly) and “oligopoly with product differentiation”.

- Importance of Selling Costs: In view of the intense competition and interdependence of the firms under oligopoly, the firms compete with each other through various sales-promotion measures like price-cutting, discounts, door-to-door campaigns, advertisement, etc. Therefore, selling costs and advertisement are very important under oligopoly market structure.
- Barriers to Entry: The existence of oligopoly in the long run necessitates the existence of barriers to the entry of new firms to the industry. In the absence of these barriers, the oligopoly may not retain its characteristic of few sellers in the long run.
- Indeterminate Demand Curve: An important feature of oligopoly is that the demand curve faced by an oligopolist firm is indeterminate. An oligopolist firm cannot ignore the reactions of rival firms in view of the interdependence of the firms. Any change in price by one firm may result in price changes by the rival firms. As a result, the demand curve faced by an oligopolist firm keeps on shifting.

Example: Sugar factory, Cement factory in Ethiopia brewery factories ...

Methods of Coordination Among Oligopoly Firms

An analysis of the characteristics of an oligopoly market that has been discussed above reveals that the profits of any single firm operating in such a market are dependent not only on its own individual output-price decisions, but also on the actions and decisions of the other firms. Therefore, oligopolists have a strong tendency to coordinate with each other to establish a mutually agreed-upon prices and outputs.

Such coordination or collusion reduces the degree of competition and thus enables the participating firms to increase profits by acting monopolistically. Collusion may also help in restricting the entry of new firms. On the other hand, a high profit incentive may initiate a firm to leave the collusion and act independently. Hence, an oligopoly may be collusive or non-collusive Note that a collusion among firms may be in the nature of a formal agreement or of an understanding. The former is called *open collusion*, while the latter is known as *tacit collusion*

© MoED FDRE Not to be republished

The methods of collusion (coordination) among oligopoly firms may be classified as follows:

- Cartel: A cartel is an explicit agreement among independent firms on subjects like prices, output, market sharing, etc. The desire of the firms to have large joint profits induces them to form cartels. Normally such a desire is short lived and therefore, the formal agreement of cartels is not a long-term phenomenon.
- Price Leadership: Another form of collusion is price leadership. In this form of co-ordinated behaviour of oligopolists, one firm sets the price and the others follow it because it is advantageous to them or because they prefer to avoid uncertainty about their competitors' reactions. Price leadership is more widespread than cartels, because it allows members to have complete freedom regarding their product and selling activities, and thus is more acceptable to the followers than a complete cartel, which requires the surrendering of all freedom of action to the central agency.
- Conscious Parallelism: This is coordination based on the understanding of each oligopolist about the market. In other words, each oligopoly firm uses its understanding about the market to make its own decision and anticipate the behaviour of the remaining oligopoly firms.

Activity 5.4

1 In this unit you have studied four different market forms (perfect competition, monopolistic competition, oligopoly and monopoly). Prepare a chart for the purpose of demonstration in your classroom, which highlights a comparative view of these market forms on the basis of various parameters such as number of sellers and buyers, nature of the product, nature of entry or exit of firms, nature of profits, etc.

2 What is the name given to a special type of oligopoly in which only two firms are present in the entire market? Note: Find out the answer from a source other than this book, since this condition was not mentioned here.

3 Try to identity the firms from different sectors of the Ethiopian economy which are good examples of oligopoly market. Make a list of such firms with comments on their working in collusion or independently.

UNIT SUMMARY

- Market is a structure in which the buyers and sellers of a commodity remain in close contact.
- Basic factors for determination of market structure :
  - number of buyers and sellers,
  - nature of the product,
  - knowledge about the market,
  - freedom of entry or exit of the firms,
  - degree of price influence,
  - degree of competition among firms in the market.
- Main market forms are:
  - Perfectly competitive market,
  - Pure monopoly,
  - Monopolistically competitive market,
  - Oligopoly.
- Perfect competition is a market situation in which there are a very large number of producers (firms) producing a homogeneous product so that no individual firm can influence the price. A firm is a price-taker under perfect competition.
- Assumptions of a perfectly competitive market are:
  - very large number of buyers and sellers,
  - homogeneous product,
  - freedom of entry and exit,
  - perfect mobility of resources,
  - perfect knowledge,
  - absence of transport costs.
- The revenues of a firm are the receipts that it obtains from selling its products.
- Total Revenue refers to the total amount of income received by the firm by selling a given amount of output

$$TR = P \times Q$$

- Average Revenue is the revenue earned per unit of the product:

$$AR = \frac{TR}{Q} = \frac{PQ}{Q} = P$$

- Marginal Revenue is the addition to total revenue which results from the sale of one additional unit of output.

$$MR_{nth} = RR_n - TR_{n-1};$$

- In a perfectly competitive market, AR = MR, and they remain constant because the firm is not required to reduce the price to sell more. AR and MR curves are horizontal and coincide. The TR curve is a straight line from the origin.
- Equilibrium of the firm: A firm is said to be in equilibrium at that level of output at which it earns maximum profits and shows no tendency either to expand or contract the output.
- Profit maximisation conditions of a perfectly competitive market:
  - In the short run: TR – TC is maximum or MR = MC and MC is rising
  - In the long run: P = LMC = LAC
- That part of the MC curve which lies above the minimum point of the AVC curve is the supply curve of perfectly competitive firms in the short run.
- Monopoly is a market structure in which there exists only a single seller of a product who is the sole producer of the product which has no close substitutes.
- Features of monopoly are:
  - single seller,
  - absence of close substitutes,
  - closed entry,
  - price-maker,
  - possibility of price discrimination.
- Monopolistic competition is the form of market in which there is a large number of sellers of a particular product, but each seller sells a somewhat differentiated product.
- Features of monopolistic competition are:
  - large number of buyers and sellers,
  - differentiated products,
  - free entry and exit,
  - selling costs,
  - non-price competition.
- The demand curve or AR curve faced by a firm under perfect competition is perfectly elastic. It is somewhat elastic under monopoly. It is more elastic under monopolistic competition.
- The profit of both a monopolistic firm and a monopolistically competitive firm is maximum at the level of output at which MR = MC and MC is rising.
- Oligopoly is a market situation in which a few large firms compete against each other and there is an element of interdependence in the decision-making of these firms.
- There are three types of coordination among oligopoly firms:
  - cartel,
  - price leadership,
  - conscious parallelism.

REVIEW EXERCISE FOR UNIT 5

I Write detailed answers to the following questions:

1 Define a 'market'. Explain briefly the factors on the basis of which different markets are defined.

2 Define perfect competition and explain its main assumptions.

3 Is a firm under perfect competition a price-maker or a price-taker? Explain.

4 Explain the conditions of a competitive market. What type of demand curve does a firm have under perfect competition?

5 Discuss the shape of the TR, AR, and MR curves for a perfectly competitive firm.

6 State and explain (using diagrams) the necessary conditions for a perfectly competitive firm's profit maximisation in the short run.

7 Explain the determination of price of a commodity under perfect competition.

8 Show how, in the long run, under perfect competition the price of a commodity is equal to its average and marginal costs of production. Does the perfectly competitive firm always operate at the minimum point of the average cost curve?

9 Describe the process by which the short-run super-normal profits of firms in a perfectly competitive industry are wiped out in the long run.

10 Explain how a segment of the AVC curve of a firm is its supply curve in the short run.

11 "The long-run equilibrium of a firm under perfect competition occurs at a point where price equals the minimum long-run average cost." Explain this statement with the help of a diagram.

12 What is monopoly? Explain the important characteristics of monopoly markets.

13 Can a monopolist sell more of the commodity at a higher price? Explain.

14 Define monopolistic competition. Explain the main features of monopolistic competition.

15 State the main reasons for the existence of monopoly.

16 Discuss, with the help of diagrams, the main difference between the AR and MR curves of a monopoly firm and a monopolistically competitive firm.

17 Describe profit maximisation under monopoly, with the help of diagrams.

18 Using diagrams, explain how profit is maximised in the short run by a monopolistically competitive firm.

19 "A monopolist always charges a price higher than the price under perfect competition". Discuss this statement.

20 Describe the characteristics of an oligopoly market.

II Distinguish between the following:

21 Perfect competition and monopoly.

22 Perfect competition and monopolistic competition.

23 Monopoly and monopolistic competition.

III Match the following:

	Column A		Column A
24	Pure monopoly	A	High degree of interdependence
25	Monopolistic competition	B	Product differentiation
26	Break-even point	C	P = MR = AR
27	Shut-down point	D	P = ATC
28	Oligopoly	E	Firm and industry are same
29	Perfect competition	F	P = AVC

IV Write 'True' or 'False' for each of the following:

30 The demand curve for the product of a monopolist is the same as the demand curve for the industry.

31 The minimum acceptable long-run price is that price which equals the minimum ATC of production.

32 Under monopoly, the sale of an additional unit increases total revenue by the price of that unit.

33 In economics, normal profit is not considered as cost.

34 The monopolist's power is unlimited because he/she can determine both price and quantity at the same time.

35 Under perfect competition, an equilibrium price is one where P = MC.

36 The demand curve for a firm under perfect competition is downward sloping.

37 All markets with many sellers and many buyers are perfectly competitive.

V In case of each of the following, four choices are given, but only one out of them is correct. Choose the correct one:

38 A monopoly firm expands its output when:

A MC > MR
B MR > MC
C MR = MC
D MR < 0

39 Total profit is maximised when:

A TC exceeds TR by the greatest amount
B TR = TC
C MC equals AVC
D TR exceeds TC by the greatest amount

40 The AR = MR = AC situation is:

A A short-run equilibrium position
B A break-even point for a perfectly competitive firm
C A long-run equilibrium position
D B and C

41 Price competition is usually found in:

A Oligopoly
B Monopolistic competition
C Perfect competition
D All of the above

42 In the short run, a perfectly competitive firm maximises its profit if:

A TC is less than TR
B MR = MC = AR and MC is rising
C MR = MC = AR and MC is falling
D A and C

VI Give short answers to the following questions:

43 How many sellers are there in a monopoly?
44 What do you call a market in which both monopoly and competition exists?
45 Under what type of market do selling costs play an important role?
46 What is the shape of the AR and MR curves under-perfect competition market?
47 What is the shape of the AR and MR curves under monopoly?
48 What is the difference between the relationship between AR and MR under perfect competition and monopoly?
49 If firms are earning abnormal profits, how will the number of firms in the industry change?

50 Which feature of monopolistic competition is monopolistic in nature?

51 State the conditions of long-run equilibrium in a monopolistic competitive market.

52 What is the relationship between marginal cost and average cost at long-run competitive equilibrium?

53 State the conditions of long-run equilibrium in a perfectly competitive industry.

54 At which point on the long run average cost curve does a competitive firm produce at long-run equilibrium?

55 What is the profit maximising condition for a monopoly firm?

56 What is the relationship between price and marginal cost at monopolistic equilibrium?

57 How do you estimate

a total revenue?

b average revenue?

c marginal revenue?

58 When marginal revenue becomes negative, how does total revenue behave?

59 Assume that the total revenue of 3 units of a commodity is Birr 24, and the marginal revenue of the 4th unit is Birr 4. Calculate the average revenue of 4 units.

60 If the total revenue of 7 units of a commodity is Birr 40 and the average revenue of 8 units is Birr 5, what is the marginal revenue of the 8th unit?

61 Assume that the marginal cost of a competitive firm is given by

$$MC = 6Q^2 - 4Q - 12$$

and the marginal Revenue of the firm is given by,

$$MR = -2Q.$$

Then find,

a the firms profit maximization level of output.

b does the firm generate profit or incurr loss at 5 units of output?

6

o

Unit Objectives

After completing this unit, you will be able to:

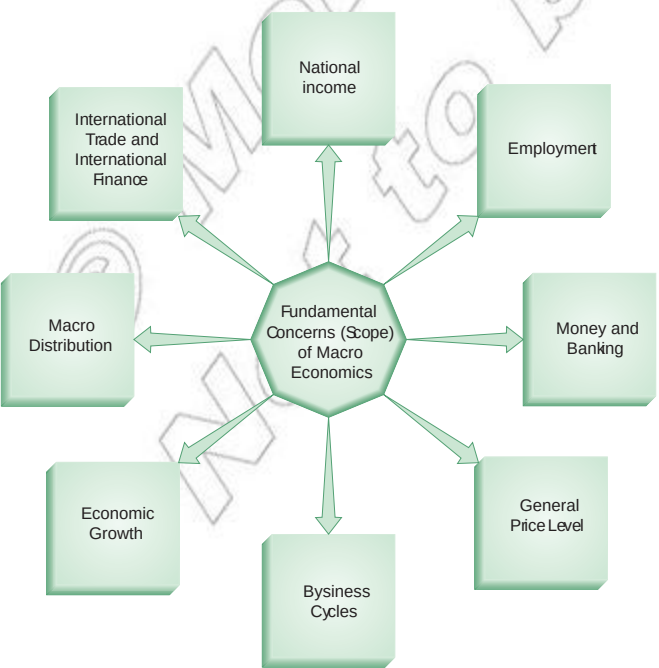
- recognize the objectives and problems of macroeconomics;
- elaborate the concepts of the business cycle;
- understand the relationship among unemployment, inflation, and budget deficit; and
- appreciate the sources of government revenue.

Main Contents

6.1 CONCERNS OF MACROECONOMICS

6.2 PROBLEMS OF MACROECONOMICS

- Unit Summary
- Review Exercise



INTRODUCTION

Recall from Unit 1 that economics as a subject has many branches and its scope includes a vast range of topics and issues. However, the core of modern economics is formed by its two major branches, namely microeconomics and macroeconomics. What we have studied in the first five units are mainly the themes and topics covered under microeconomics, which primarily deals with the behaviour of individual economic units. On the other hand, macroeconomics deals with the aggregates or averages covering an entire economy. For instance, total employment, national income, national output, total investments, total consumption, total savings, aggregate supply, aggregate demand and general price level, wage level and cost structure come under the scope of macroeconomics. In other words, macroeconmics is aggregative economics which examines the interrelations among various aggregates, their determination and causes of fluctuations in them.

Because the central problem of macroeconomics is the problem of the determination of income and employment, it is known as the theory of income and employment or simply income analysis. Aggregate demand and aggregate supply are the main tools of analysis in macroeconomics.

We Introduce the fundamental concerns (scope), objectives, and central problems of macroeconomics in the present unit. Then we continue by studying the tools and methods of macroeconomic analysis through the units that follow.

6.1 CONCERNS OF MACROECONOMICS

At the end of this section, you will be able to:

- define the concepts of macroeconomics.

Key Terms and Concepts

- National income
- Employment
- Business cycle
- Price stability
- Inflation
- Budget deficit

Start-up Activity

Discuss the macroeconomic development of the FDRE for the last five years.

The Fundamental Concerns (Scope) of Macroeconomics

The scope of aggregative economic analysis or the fundamental concerns of macroeconomics can be summarised as follows:

- National Income: Macroeconomics deals with national income. It includes the study of the concepts of national income, product, and expenditure and the methods of measurement of aggregates and sub-aggregates of national income and output.
- Employment: Macroeconomics is also concerned with the determination of the level of employment in the whole system and variations in it. It deals with aggregate demand, aggregate supply, consumption, savings, and investment functions which determine the level of employment in an economy.
- Money and Banking: Macroeconomics deals with monetary theory, which further deals with the demand and supply of money, central banking, commercial banking, monetary policy, and the impact of monetary changes upon the general level of economic activity.
- General Price Level: Macroeconomics concentrates upon the general level of prices. It explains the inflationary and deflationary movements in the system and the impact of these movements upon the general level of economic activity.
- Business Cycles: The theories of business cycles and policies to control cyclical fluctuations come within the sphere of macroeconomics.
- Economic Growth: Economic growth is a long-run process. It depends upon complex economic, sociological, institutional and technical factors. Macroeconomics analyses the actions and interactions of these factors.
- Macrodistribution: Macrodistribution theories deal with the distribution of income among various factors. An analytical study of these theories helps in achieving equitable distribution of income and constitutes a part of macroeconomics.
- International Trade: International Trade and International Finance (or International Economics): Macroeconomics deals with the theories of international trade, problems related to tariff and non-tariff barriers upon trade, balance of payments, foreign exchange, international capital flows, and international economic order.

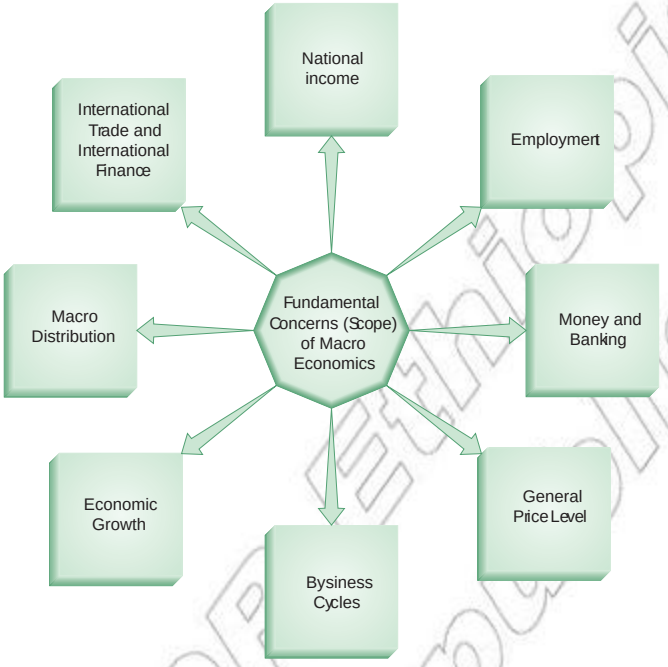


Figure 6.1: Fundamental Concerns of Macroeconomics

General Objectives of Macroeconomic Policy

We know that macroeconomic analysis deals with the behaviour of the economy as a whole with respect to output, income, employment, general price level and other aggregate economic variables. With a view to bringing about desirable changes in such variables, nations (developed as well as developing) need to adopt various macroeconomic policies. These policies vary from one economy to another and according to the prevailing economic conditions within a specific economy.

The general objectives of a macroeconomic policy are to achieve:

- maximum feasible output
- high rate of economic growth
- full employment
- price stability
- equality in the distribution of income and wealth, and
- a healthy balance of payments.

To achieve these objectives, normally three types of macro-economic policies – fiscal policy, monetary policy, and income policy – are adopted. We shall discuss these policies in detail in a later unit (Unit 10).

Activity 6.1

Discuss this question in your economics workgroup: Are all the general objectives of a macroeconomic policy (as given in your text), are applicable in the specific case of Ethiopia?

6.2 PROBLEMS OF MACROECONOMICS

At the end of this section, you will be able to:

- identify and analyze problems of macroeconomics;
- display the business cycle and the overall economic activity;
- explain the meaning of unemployment;
- identify and give examples of types of unemployment;
- distinguish the differences among types of unemployment;
- measure unemployment level;
- examine the impact of unemployment on economic growth;
- define what inflation is;
- compute the rate of inflation and interpret the result;
- explain causes of inflation;
- examine the impact of inflation on economic growth;
- explain the effects of inflation in terms of redistribution and output;
- define budget;
- identify and explain the source of government revenues;
- classify the sources of tax and non-tax revenue;
- identify and explain external assistance;
- explain capital revenue;
- define and identify types of expenditure.

Key Terms and Concepts

- Recession
- Depression
- Recovery
- Structural unemployment
- Frictional unemployment
- Cyclical unemployment
- Cost-push inflation
- Demand-pull inflation
- Surplus budget
- Ordinary revenue
- Recurrent expenditure
- Capital expenditure

© Ministry of Education
Not to be republished

As has been stated in the introduction to this unit, the central problem of macroeconomics is the problem of determination of income and employment. We also know that macroeconomics is concerned with problems such as inflation, business fluctuations, inequalities of income and wealth, instability of prices, budget and trade deficit, etc. In the following sections we discuss in detail four of these problems, namely, business cycle, unemployment, inflation and budget deficit.

Business Cycle

Business cycle or trade cycle refers to the regularly occurring fluctuations in economic activity in market economies. In a business cycle, there are wave-like fluctuations in four interlinked economic variables: employment, income, output and price level. When the values of these economic variables over time are plotted on a graph, we get a wave-like figure, which is given the name business 'cycle'.

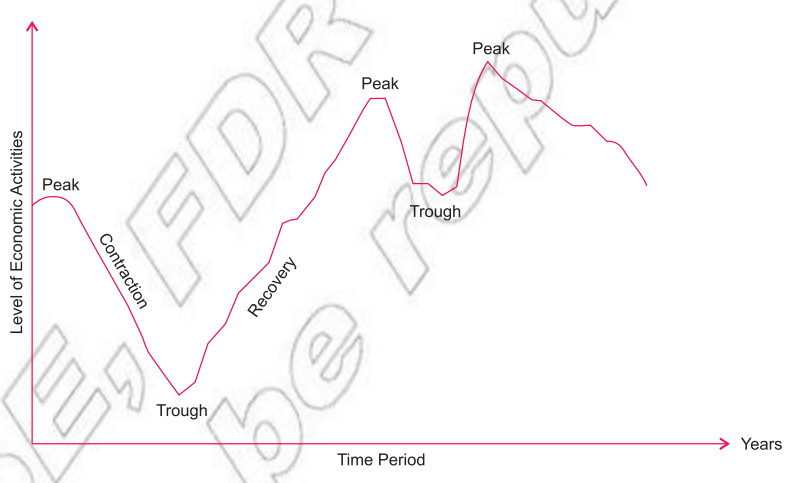


Figure 6.2: Business Cycle Phases

Phases of Business Cycles

A business cycle is typically divided into four phases:

- peak (or boom)
- contraction (or recession)
- trough (or depression)
- recovery (expansion)

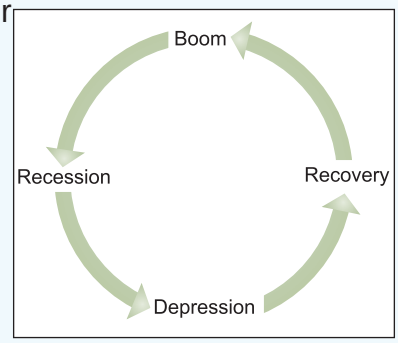


Figure 6.3: Business Cycle

What are these four phases?

- Peak or Boom: This is a phase of economic activity characterised by rising demand, rising prices, rising investment, rising employment, rising incomes, rising purchasing power and so on. Boom conditions prevail in the business. The investors, therefore, voluntarily undertake risks and go in for investment, which further fuels boom conditions through the working of the multiplier effect.
- Contraction or Recession: During the boom period, there is over-optimism in business psychology, and thus the economy can get over-heated. If that occur, the monetary authorities, the financial institutions and business itself may become cautious. Thus, there may be cuts in investment, resulting in cuts in employment, a fall in incomes, and declines in purchasing power and demand. Prices may then begin to fall. The economy may be caught now in a web of pessimism. This marks the phase of recession or contraction.
- Trough or Depression: If effective corrective measures cannot be undertaken for a recession, the economy may find itself caught up in the whirlpool of depression. This is a stage when the business confidence is at its lowest. Investment, employment, output, income, and prices reach bottom.
- Recovery: As the economy moves out of depression, it enters the phase of recovery. In a sustained recovery, the level of investment, employment, output, income and prices move upwards. This may finally result in boom conditions in the economy, and thus, the cycle is complete.

Note that there are significant changes in output, employment and prices during the business cycle. We find reductions in output, employment and prices during recession and depression, while they tend to move in the upward direction during recovery and boom.

Characteristic Features of Business Cycles

- Business cycles are the wave-like fluctuations in economic activity as reflected in basic economic variables like employment, income, output and price level,
- These fluctuations are cyclical in nature,
- The sequence of changes in a business cycle (i.e., boom, recession, depression and recovery) recur frequently and in a fairly similar pattern,
- Periodicity between the cycles need not be same or similar,

- Business cycles are fluctuations found in overall economic activities, and are not limited to any particular firm or industry,
- Normally, if the boom is high the succeeding depression will also be severe. However, this relationship might not hold good in the reverse,
- Business cycles usually last for a period of 2 to 10 years.

Causes of Business Cycles

Business cycle is the tendency for real output to rise and fall over time in a reasonably regular pattern. It is alternating increase and decrease in level of economic activity.

Note

In a case of boom or expansion, the causes are normally opposite to those of recession, since the situations are mirror images of each other.

Activity 6.2

1 Identify the two well-known global depressions in recent economic history.

2 Making use of the internet and other resources, collect available information and write a brief note on the Great Depression of the 1930's.

3 Prepare a report on the current global economic slowdown (global financial crisis), which started in December 2007. If possible, highlight the origin of the crisis and its causes. Collect the required information from the internet and other resources.

Unemployment

To have a better understanding of the concept of unemployment, we must first discuss what we mean by employment. We also need to know what is meant by the term labour force.

Employment

This refers to any arrangement by which a person earns income or a means of livelihood Such an arrangement may be in the form of self-employment, wherein a person uses his/her own resources (apart from his/her labour) to make a living. Examples of self-employment are the activities of shopkeepers, traders, businessmen, professionals, etc. In contrast, the only resource that other people have for learning their livelihoods is their own labour. They offer their labour

services to others and in return get wages. Such an arrangement, in which a worker sells his/her labour and earns wages in return, is called wage-employment. In this case, the supplier of labour (worker) is called employee and the buyer of the labour is called an employer.

In the case of self employment, a person is himself/herself an employee as well as the employer.

Labour Force

A labour force consists of all those who are fit for work and are willing and available to work. In other words, if we exclude children, old persons, individuals who are unable to work, etc., from the population of a country, we get the number of those who are able to work. We further deduct from this those who are not willing or are not available to work. This gives us the labour force. The ratio of this labour force to the total population is called the labour-force participation rate. This gives us the number of people who are able to work, willing to work and available for work. To arrive at the size of a labour force, it is customary to exclude children below the age of 15 years and persons above the age of 60 years from the total population. In Ethiopia, among poor people, unfortunately even children take up jobs to augment family earnings.

Meaning of Unemployment

Unemployment refers to a situation where the persons who are able to work and willing to work, at the current market wage rate, fail to secure work or activity which gives them income or a means of livelihood. Thus, for a person to be categorized as unemployed, two conditions must be fulfilled:

- that the person is without a job and able to work
- the person wants to have a job and is willing to work at the current market wage rate.

Those people who have other means of living, like property incomes, and thus do not desire to have a job cannot be called unemployed. They are idle or not working due to their own will. Thus they can be termed as 'voluntarily unemployed'. Such people are not in the category of unemployed persons. In the category of unemployment we include only those people who are unemployed involuntarily — i.e., they want work but do not get it. Involuntary unemployment exists when able-bodied, willing persons fail to get jobs at the on-going wage rate.

© FDRE Ethiopia Not to be republished

Types of Unemployment

Normally, in economics, three different types of unemployment are identified—frictional, structural, and cyclical.

Frictional Unemployment

This is temporary unemployment which exists during a period of the transfer of labour from one occupation to another.

Frictional unemployment may also arise where people are thrown out of work in one location and are unwilling or unable to move to a similar work in another area. For example, big industrial units and polluting industries are sometimes moved out of large towns and cities and relocated in distant places. The labour thus thrown out of jobs may be either unwilling or unable to move to these new locations of work, thus giving rise to frictional unemployment. Other examples of frictional unemployment are students searching for jobs for short durations or people reentering the labour force due to changed social or family situations.

Structural Unemployment

Structural unemployment refers to a situation in which workers become jobless due to loss of demand in particular regions or industries. For example, a change of energy use from coal to electric power is bound to curtail coal mining activity and cause unemployment there. Similarly, an increased use of synthetic rubber is bound to reduce demand for natural rubber and lead to unemployment in rubber plantations. And since the person thus unemployed may not be in a position to learn the technologies used in the newly expanding industries, they may be rendered permanently unemployed. Thus, unemployment which arises due to change in the pattern of demand, leading to changes in the structure of production in the economy, is called structural unemployment. As we may say, structural unemployment signifies a mismatch between the supply of and the demand for labour.

Cyclical Unemployment

As the name 'cyclical unemployment' suggests, this form of unemployment is associated with 'trade cycles' or 'business cycles' or cyclical fluctuations in economic activity. This is caused by slackness in business conditions. During depressions, investment activities get discouraged. Contractions in business activities renders large numbers of workers unemployed.

© FDRE Ethiopia Not to be republished

Thus, unemployment which arises due to inadequate overall demand associated with the downswing, recession or depression period of a trade cycle is called cyclical unemployment

Remarks: In the study and analysis of unemployment, we come across many other terms and concepts. A brief introduction to such terms is given below, for the sake of reference.

- Full Employment: This refers to a situation where all those workers who are able and willing to work get employment. At full employment levels, there is an optimum utilisation of resources.
- Underemployment: This refers to a situation in which people are engaged in jobs but these jobs do not measure up to their capabilities, efficiency and qualifications.
- Involuntary Unemployment: This refers to a situation in which the workers are willing to work under any conditions and at any wage rate but they fail to get employment. In some parts of the world, the economy fails to provide employment opportunities to the work force.
- Voluntary Unemployment: When the economy offers employment opportunities to the workers, but they themselves are not willing to take up jobs because employment conditions, such as wage rate, location, promotional avenues, physical environment, attitude of the employer, etc., do not suit them – such a situation is known as voluntary unemployment.
- Technological Unemployment: This is generally found in the advanced countries. The main cause of this unemployment is the introduction of a new technology which requires changes in a labour force.
- Disguised Unemployment: When more workers are engaged in a type of work than actually are required to do that work, it is called disguised unemployment.
- Seasonal Unemployment: Employment and unemployment levels vary with different seasons in many sectors of the economy. There are busy seasons, when most of the people are employed or even overworked, and there are slack seasons, when most of them are without work. This type of unemployment is called seasonal unemployment. Apart from agriculture, such unemployment is found in seasonal industries like ice factories, or seasonally affected trades like the tourist industry.

Measurement of Unemployment

Unemployment is usually measured as the ratio of the unemployed persons to the total labour force in a country and is expressed in percentage terms. Thus:

$$\text{Rate of unemployment} = \frac{\text{No. of unemployed persons}}{\text{Total labour force}} \times 100 \quad (6.1)$$

Remarks: Usually in a developing country like Ethiopia, unemployment is a mixture of many different types of unemployment. Thus it is not possible to estimate it by using any single measure of unemployment. Such countries have open as well as disguised unemployment in agriculture, underemployment and seasonal unemployment in both rural and urban areas, industrial unemployment, and unemployment among educated persons in urban areas. It is therefore not possible to use the conventional yardstick of 'involuntary idleness' as the common measure of all these types of unemployment. The concept of involuntary idleness, i.e., the able-bodied and willing persons not finding a job at the ongoing wage rate is only a measure of open unemployment. We cannot use it for measuring other types of unemployment.

Impact of Unemployment on Economic Growth

Unemployment is a major problem worldwide, affecting not only underdeveloped or developing countries but also the developed ones. Its economic cost is very high, and it is a big hurdle in the path towards rapid economic development or economic growth. Because of unemployment, the level of national output remains below the optimal level, since the available human resources are not able to contribute to the production of goods and services. We list below some of the major adverse economic effects of unemployment.

- Loss of Valuable Human Resources: Unemployment means that some able and willing persons have not been able to get work. In other words some labour is lying idle. Since labour is an important agent of production, unemployed labour means unused human resources, and consequently less than full production. This naturally means lower GNP and smaller per capita income.
- Increase in Poverty: Unemployment and poverty go together. When some people are unemployed, and hence unable to contribute in production and income, they become dependent upon others. Sharing other peoples' income in low income groups depresses overall consumption levels and pushes people below the poverty line.
- Unemployment is Demoralising: Unemployment has a demoralising effect on people. Of all the evils befalling mankind, unemployment is one of the worst. It creates a sense of unwantedness among the unemployed persons and lowers their self esteem. A nation of demoralised people cannot make any significant economic progress.

- **Exploitation of Labour:** Unemployment is a situation in which supply of labour is in excess of its demand. This excess labour supply creates competition among the labourers who may offer their services at wage rates lower than those prevailing in the market. The employers may thus offer only lower wages and demand longer hours of work and thus exploit the poor workers.

Remark: The economic cost of unemployment is certainly very high; its social cost is also not less. Unemployed people failing to get any legitimate means of livelihood, may take recourse to anti-social activities such as gambling, theft, robbery, etc. This creates law and order problems for the country. When unemployment assumes wider proportions, the unemployed people may become restless and pressurise the government for more jobs. This pressure may initially take the form of simple demonstrations, but may ultimately get manifested in the dangerous forms of terrorism, militancy and secessionist demands, which is bound to cause political instability, economic destability and social tensions.

Activity 6.3

1. Identify the various types of unemployment found in Ethiopia.
2. Collect available statistical information related to unemployment in Ethiopia and prepare a brief report based on the information that you could collect.
3. Is unemployment a major problem for the Ethiopian economy? Discuss in a group.
4. Discuss the major causes of unemployment in Ethiopia.
5. Discuss the economic cost of unemployment.

Inflation

Since the second World War price rise has been a universal phenomenon; however, the pattern and degree of rise has been different in different countries. It is generally observed that prices do rise during the process of economic development. It happens so because money supply immediately increases, but corresponding to that, the national output does not increase. However, if the prices go up much more than what they should have on account of development activities, it is a cause of concern for the country and its economic planners. Such a situation is termed as inflation.

Meaning of Inflation

Inflation, in general terms, is described as a situation characterised by a sustained increase in the general price level. It may be noted thus:

- a small rise in prices or an irregular price rise cannot be called inflation. It is a persistent and appreciable rise in prices which is called inflation.
- during inflation, all costs and prices do not rise together and in the same proportion. It is an increase in the general level of prices measured by a price index, which is an average of consumer or producer prices.

Causes of Inflation

Inflation cannot be attributed to a single factor. Rather, a mix of several factors is responsible for it. Normally, these factors are divided into two broad types: Demand-Pull factors and Cost-Push factors. Accordingly, we have the concepts of Demand-Pull inflation and Cost-Push inflation

Demand-Pull Inflation

When the demand for goods and services exceeds the available supply at current prices, it is a demand-pull inflation. The situation is described as "too much money chasing too few goods". For some reason people come into possession of more money or purchasing power, but there is no corresponding expansion of the supply of goods and services. The expenditure increases, and prices keep on rising continuously.

The various causes for demand-pull inflation include:

- An increase in government expenditure: This increases the demand for goods and services, and hence, is responsible for price rise,
- An increase in money supply: Such a situation is followed by rises in prices. Money represents purchasing power over goods and services,
- An increase in investment: When this is done by the private or public sector it leads to a large demand for goods and services, which is followed by price rises,
- An increase in wages: particularly when this does not match a corresponding increase in productivity, it increases the general price level,
- Black money: Such money, which is normally spent on non-essential goods and services, plays an important role in pushing up the prices in a country.

- Deficit financing: This is an important factor for rises in money supply and therefore for rises in price level,
- Credit Expansion: This is also a major cause of price rise. As a result of credit expansion, people buy more goods, leading to increases in the demand for goods and this leads to increase in the prices of goods.

Cost-Push Inflation

Inflation resulting from rising costs of production and slack resource utilisation is called cost-push inflation. This is sometimes also known as supply-shocked inflation. Setbacks in agricultural and industrial production due to various reasons –shortage of raw materials, power breakdowns, strikes and lockouts, bad weather conditions, increase in input prices, etc. – lead to a decreased supply of goods in comparison to their demand, which further leads to price rise. Also, hoarding, both by firms and households, contributes to restricting the supply of goods and services in the economy, which leads to a rise in price level. Firms are interested in speculative dealings to earn large profits, whereas households hoard goods when they expect that prices will rise in the future.

Remarks: Demand-pull and cost-push inflation go together in an economy. In both situations, two common features exist:

- rise in the prices of factor inputs, and
- rise in the prices of final goods.

Therefore, demand-pull and cost-push inflation intermingle, and it may not be possible to separate them.

Measuring Inflation

Inflation means a persistent or sustained rise in general price level. Thus measuring inflation means a measurement of variations in general price level. To do this, various types of price index numbers or simply price indexes, such as wholesale price index, consumer price index, etc. are constructed. These price indexes are indicators of the overall or general price level. The Consumer Price Index (CPI) is the most widely accepted index for measuring the rate of inflation, since it measures the average price of goods and services bought by general consumers. CPI measures the cost of a "market basket" of consumer goods and services relative to the cost of that bundle during a particular base year. The base year is a reference year.

$$CPI = \frac{\text{Cost of a market basket of consumer goods and sevices in a particular year}}{\text{cost of same basket during the base year}} \times 100 \quad (6.2)$$

Rate of Inflation

Rate of inflation measures the extent of the increase in the general price level over time. It is usually measured as the percentage change in the general price level from one year to the next

$$\text{Rate of inflation (year t)} = \frac{\text{CPI year t} - \text{CPI (year t 1)}}{\text{CPI (year t 1)}} \times 100 \quad (6.3)$$

Example: Calculating the consumers price index and the inflation rate. Assume a simple economy in which a typical consumer buys only two goods-wheat and edible oil. The consumer buys 50 kg of wheat and 10 liters of oil per year and assume that the prices of these basket of goods in three different years are the following

YEAR	Price of a kilo of wheat	Price of a liter of oil
2000 E.C.	Birr 2	Birr 10
2001 E.C.	3	13
2002 E.C.	2	14
2003 E.C.	4	24

Find: 1 The price index in each year

2 The inflation rate from 2000 E.C. to 2001 E.C., from 2001 E.C. to 2002 E.C., from 2002 E.C. to 2003 E.C. and in 2003 E.C. from 2000 E.C.

Solution:

Step 1: Compute the cost of the basket of goods in each year.

Year Price of a kilo of wheat Price of a liter of oil

2000 E.C. (Birr 2 per kg × 50 kg) + (Birr 10 per liter × 10 liter) = birr 200
2001 E.C. (Birr 3 per kg × 50 kg) + (Birr 13 per liter × 10 liter) = birr 280
2002 E.C. (Birr 2 per kg × 50 kg) + (Birr 14 per liter × 10 liter) = birr 240
2003 E.C. (Birr 4 per kg × 50 kg) + (Birr 20 per liter × 10 liter) = birr 400

Step 2: Choose one year as a base year (2000) and compute the consumer price index in each year

Consumers Price Index in 2000 E.C. =

Consumers Price Index in 2001 E.C. =

Consumers Price Index in 2002 E.C. =

Consumers Price Index in 2003 E.C. =

Step 3: Use the consumer price index to compute the inflation rate from previous year

Inflation Rate in year 2 = 00

Inflation rate in 2001 E.C. from 2000 E.C. = 0 00 00 0 00

Inflation rate in 2002 E.C. from 2001 E.C. = 0 0 00 0 Approximately

Inflation rate in 2003 E.C. from 2002 E.C. = Approximately

Note that: The value (–14.3%) in the year 2002 E.C. shows a decrease in the general level of the prices of goods and services. A decrease in the general level of the prices of goods and services is known as deflation. Deflation is the opposite of inflation.

Therefore, there was inflation in the years 2001 E.C. and 2003 E.C. and deflation in the year 2002 E.C.

The Impact of Inflation On Economic Growth

Inflation has different levels or degrees of severity, described as moderate, galloping, and hyper inflation. A moderate inflation is generally believed to be a necessary condition of economic growth. A state of zero inflation rate is not expected to yield the desired growth rate in the case of a developing economy. Inflation leads to a shift in real incomes, provides encouragement to investment, and can be used as a tool to raise the level of savings. However, inflation may also retard economic development in a number of ways. It may lead to lopsided development; lead to increased consumption and have a negative effect on savings; have an adverse effect on the balance of payments; and introduce uncertainty and instability. It may be noted that unchecked inflation may change into hyper-inflation, which is the most severe type of inflation.

© MoE FDR Ethiopia Not to be republished

We discuss briefly, in the following paragraphs, some of the specific effects of inflation including redistribution effect, price effect, income effect, and effect on production (or output). For a better understanding of the impact of inflation on economic growth, we classify these effects into two categories: favourable effects and adverse effects.

I Favourable Effects

Mild inflation has some favourable effects on production, capital formation and economic development. Some such favourable effects are the following:

- Effect on Production: When prices are rising, profit expectations become brighter and thus investment climate becomes favourable. Therefore the entrepreneurs undertake new investments, set up new production units, and expand the existing plants. All these lead to greater production.
- Effect on Capital Formation:Rising prices bring in higher profits to the capitalists. In turn, a greater part of these profits is reinvested with a view to earning further profits. Thus, investment increases and rate of capital formation becomes higher.
- Effect on Employment:Rising prices lead to increased investment by the entrepreneurs in various sectors of the economy with a view to producing and selling larger quantities of goods and services, and thus further adding to their profits. Increased production requires more labour and other resources. Thus employment of labour also increases.
- Effect on Economic Development:Rising prices that raise profit expectations, build up favourable investment climate, and increase production and employment, thus lead to an increase in the growth rate of national income and raise the tempo of economic development.
- Inflation May be Self-Liquidating: As discussed above, a slow and mild rate of inflation helps to increase investment, production and employment. It increases the tempo of development. Thus, over a period of time more goods flow from the farms and factories, and the overall supply in the economy increases. Since inflation is caused by an excess of demand over supply, the supply will increase after some time and become equal to demand. The prices would thus fall due to increased supply, and inflation would end. Thus, inflation can be self-liquidating.

II Adverse Effects

Many times, inflation is not self-liquidating; it becomes self-sustained. Then the price level keeps on increasing continuously over a long period of time.

Accordingly, inflation starts showing its adverse effects, some of which are the following:

- Income Effect: Inflation adversely affects fixed-income groups like wage and salary earners and those whose income consists of rent from property or interest on loans. The wages and salaries are fixed payments which do not increase with prices (unless full dearness allowance equivalent to price rise is given). Thus, when wages remain more or less fixed, rising prices continuously reduce purchasing power and hence the wage and salary earners suffer a loss in real income. The same is the case with other fixed incomes like rents, interest, etc., which are contractual payments and do not increase with rising prices.
- Saving Effect: With a rise in prices, the purchasing power of money declines. Thus more money has to be spent to buy the same amount of goods and services. This reduces the level of savings out of a given level of income.
- Redistribution Effect: Under mild inflation or a continued slow rise in prices, profits keep on increasing. As wages and salaries remain more or less fixed, income of the industrial and business classes increases relative to the income of working classes. Thus, there is a redistribution of income in favour of the rich capitalists and business people, and therefore, the gap between the rich and the poor increases. The share of profits in national income increases, whereas that of wages and salaries falls, and thus income redistribution takes place in favour of the richer sections of society.
- Price-Wage Spiral: Due to rises in prices, labourers demand higher wages. If this demand is fulfilled, the increase in wages leads to a further rise in prices. The rise in prices, in turn, leads to further rises in wages. This creates a vicious circle of wage and price rises.
- Effect on Economic Planning: Most of the under-developed countries, including Ethiopia, have adopted planning as a means for furthering rapid economic development. A plan is prepared, say for five years ,in which targets are fixed and resources are mobilised and put in the planned channels of production to achieve these targets. If prices start rising, then the actual cost of inputs to be used for achieving production targets becomes higher, and hence more financial resources are needed. But under inflation, savings get reduced and, at the same time, it becomes more difficult for governments to impose new taxes to collect more revenue. Hence, plan targets are either curtailed or most of them remain beyond reach, thereby upsetting the whole planning process.
- Effect on Balance of Payments: Balance of payments shows how much a country has to receive from the rest of the world as payment for goods and services it has exported and how much it has to pay

for such imports from other countries. When total payments are more than the total receipts, it is called a balance of payments deficit. With inflation or rising prices this deficit increases. This is because under prevailing high prices, foreigners will not buy our high priced goods. So, our exports will fall. On the other hand, our people will buy more of the relatively cheaper foreign goods, thereby increasing our imports. Since imports are more than exports, it means that the country has to make more payments than what it receives. Thus the deficit in balance of payments increases.

Remarks: Besides these, effects rising prices encourage speculation and hoarding, profiteering, corruption, strikes, social unrest, and many more problems. It is therefore necessary that inflation should be controlled and prices stabilised or allowed to rise only within narrow limits.

Activity 6.4

Identify the various tools and methods used by the government to control inflation.

Note: In addition to referring to other sources, study Unit 10 of your textbook to help you in carrying out this activity.

Budget Deficit

Government budget is a forceful instrument of economic growth. In simple words, it is an account of planned expenditures and expected receipts of the government, usually for a year. When the receipts of the government are less than the expenditure, the government is said to have a budget deficit. The government deficits or budget deficit is one of the major concerns of macroeconomic policy of a country. With a view to have a better understanding of budget deficit or the budgetary process itself, we discuss the major components of government budget and some allied aspects.

Meaning of Budget

The budget provides details of the various sources through which money flows to the government, and also the details of the various types of expenses on which money is spent by the government. It is a useful tool to plan and control the fiscal affairs of the government. We may say, a budget shows the details of the planned expenditures of the government program and the expected revenues from tax and non-tax sources for a year. We need to specify, at this point, the objectives, types and components (structure) of budget. We do this as follows.

Objectives of a Government Budget

The general objectives of a government budget are the following:

- Economic Growth: to promote rapid economic growth so as to improve the living standard of the people.
- Reduction of Poverty and Unemployment: to eradicate mass poverty and unemployment by creating maximum employment opportunities and providing maximum social benefits to the poor. Social welfare is the single most important objective of the government.
- Reallocation of Resources: to reallocate resources in line with social and economic objectives.
- Reduction of Inequalities: to reduce inequalities of income and wealth through levying taxes and granting subsidies. Equitable distribution of wealth and income is emphasised. Economic progress in itself is not a sufficient goal but the goal, must be equitable progress.
- Price Stability: to maintain price stability and correct business cycles involving depression characterised by falling output, falling prices, and increasing unemployment.
- Management of Public Enterprises: to manage public enterprises which are of the nature of monopolies like railways, electricity, etc.

Types of Budget

As we now know, a budget shows the receipts and expenditures of the government. It is not necessary that the receipts and expenditure should be equal. usually, it is not be so. There may be a surplus or deficit in the budget. Accordingly, we have the following three types of budget:

A Surplus Budget:

If the receipts of the government are more than its expenditure, the government is said to have a surplus budget.

A surplus budget implies that the government is pumping out more money from the economic system than what it is pumping back in. When the government draws money from the economic system, it has a contractionary effect. The level of economic activity falls. A whole sequence of events may follow indicated in Figure 6.4. The economy will tend to move backwards.

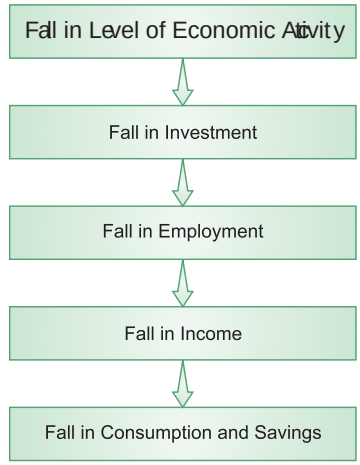


Figure 6.4: Implication of budget surplus

B Balanced Budget:

- If the receipts of the government equals its expenditures, the government will be said to have a balanced budget.
- A balanced budget will have a neutral effect on the level of economic activity. It will have neither an expansionary effect nor a contractionary effect on the economy.

C Deficit Budget

If the receipts of the government are less than its expenditure, the government is said to have a deficit budget.

A deficit budget implies that the government is pumping more money into the economic system than it is pumping out. When it puts in more money into the economy, the level of economic activity expands. The process works as shown in Figure 6.5

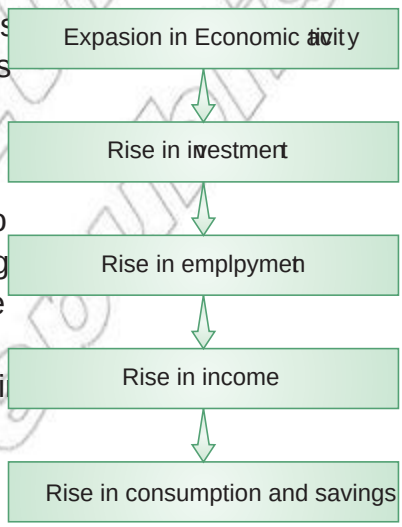


Figure 6.5: Implications of budget deficit

This will move the economy further on the growth path. Usually governments of developing economies plan for a deficit budget.

Remarks: A deficit budget is financed by domestic borrowing, external borrowing, and the printing of new currency.

Structure (or Components) of Budget

Usually, budget is divided into two parts: Revenue Budget and Expenditure Budget

A Revenue Budget

This forecasts the total revenue collections of the government from tax and non-tax sources.

In Ethiopia, it is classified into three parts:

i Ordinary Revenue,
ii External Assistance, and
iii Capital Revenue.

i Ordinary Revenue: The total of ordinary revenue is made up by tax revenue and non-tax revenue. Tax revenue is further divided into three parts – direct tax, indirect tax, and foreign trade tax.

a A tax is generally defined as a compulsory payment that the citizens of a country have to make to the government without a quid pro quo, i.e., the taxpayers cannot expect to get any direct benefit in return for the tax paid by them.

Those who are liable to pay tax have to pay the tax; otherwise they can be prosecuted and penalised by the state. Now, let us look at the three kinds of taxes.

- Direct taxes: These are those taxes which are paid by the same persons on whom they have been levied. The burden of the tax cannot be shifted onto anybody else. An example of this is personal income tax. Income tax is levied on individual persons on the income earned by them in a year. Every person who is liable to pay this tax has to bear the burden of this tax. Other direct taxes imposed in Ethiopia include rental income tax, business income tax, agricultural income tax, tax on dividend and lottery winning, and land-use fees and leases.
- Indirect taxes: These taxes, on the other hand, are those taxes whose burden can be shifted. Examples are excise duties and sales tax. These taxes are imposed on the producers and sellers of goods and services. They are liable to pay the tax to the government. But the producers (or sellers) can transfer the burden of this tax onto the consumers, collect the tax-amount from them, and deposit the same with the government. Indirect taxes in Ethiopia include excise and sales tax on domestically manufactured goods, services sales tax, stamps and duty, and VAT.

Remarks: Direct taxes are normally imposed on income, wealth, and property, whereas indirect taxes are levied on goods and services.

- Foreign trade tax: This includes custom duty, excise tax and sales tax on imported goods.

b Non-tax revenue is the revenue collected by the government from sources other than tax. These include income of the government by way of sale of goods and services by various departments of the government. Major constituents of non-tax revenue in Ethiopia are charges, fees, fines, pension contribution, and investment revenue.

ii External Assistance: Grants received in cash, or some other form, from outside the country are known as external assistance. These receipts form an important source of financing the deficit budget of the government and play an active role in economic development of the country. External assistance received from friendly countries is called bilateral assistance, whereas assistance (grant) received from multilateral or international institutions is known as multilateral assistance.

iii Capital Revenue: Capital revenue is the third constituent of revenue budget. It comprises the money received by the government from the sale of government assets, collection of loans, counterpart fund and external loans.

Expenditure Budget

Expenditure budget is a forecast of the total expenditure by the government, in a year. In Ethiopia, it is classified into two parts:

i Recurrent Expenditure, and

ii Capital Expenditure.

i Recurrent Expenditure: Recurrent expenditure represents expenses made by the government which are recurrent in nature, i.e., they are repeated. Normally, it is an expense on consumables that facilitate productive activities, for example, salaries of civil servants, purchase of raw materials, fuels and other factors of production. The recurrent expenditure is classified in Ethiopia under four functional categories: Administrative and General Services; Economic Services; Social Services; and Other Expenditures. All government bodies fall under one of these categories. For instance, Administrative and General Services include such activities as performed by political organs of the state such as council of representatives, ministries, defence and so on. Economic Services include such activities as ones that come under agricultural, industrial and service sectors. The Social Services include such activities as health, education, and culture. Other Expenditures include pension payments, repayment of public debts, provision of unforeseen expenses and similar items.

© MoE FDRE Ethiopia Not to be republished

ii Capital Expenditure: Capital expenditure represents expenses made by the government for the implementation and expansion of development projects. These are in the nature of acquisitions of fixed assets like buildings, machinery, equipment, etc. Government expenditures on construction of infrastructure, industries, and research and development programs are also part of capital expenditure. The capital expenditure is classified in Ethiopia under three categories: Economic Development; Social Development and General Development. Economic Development includes production activities in the agricultural and industrial sectors and economic infrastructure in mining, roads, energy, commerce and communication. Social Development includes such activities as education, health, urban development and social welfare. General Development includes services in statistics, cartography, and public and administrative buildings.

Remarks:

- In most developing countries, recurrent expenditure is mostly financed from domestic revenue sources that is, from tax and non-tax revenues, whereas capital expenditure is usually financed by external borrowing and grants.
- The annual budget for the Federal Government of Ethiopia is prepared by the Ministry of Finance and Economic Development (MoFED) and the budgets for the regional governments by the respective regional finance bureaus.

Activity 6.5

1 Make a list of direct taxes prevalent in Ethiopia.

2 Identify the main objectives of government expenditure in a developing economy.

3 With your friends, discuss the merits and demerits of direct taxes. Prepare a brief report on the outcomes of your group discussion.

© Not to be republished

UNIT SUMMARY

- Macro-economics deals with aggregates or averages covering the entire economy. For instance, total employment, national income, national output, total investments, total consumption, total savings, aggregate supply, aggregate demand and general price level, wage level, and cost structure come under the scope of macro-economics. In other words, it is aggregative economics which examines the interrelations among various aggregates, including their determination and the causes of fluctuations in them.
- General objectives of a macro-economic policy are to achieve:
  - Maximum feasible output
  - High rate of economic growth
  - Full employment
  - Price stability
  - Equality in the distribution of income and wealth and
  - A healthy balance of payments.
- Macroeconomics is concerned with problems such as inflation, business fluctuations, inequalities of income and wealth, instability of prices, budget and trade deficit, etc.
- Business cycle or trade cycle refers to regularly recurring fluctuations in economic activity in market economies.
- A business cycle is typically divided into four phases:
  - Peak (or boom)
  - Trough (or depression)
  - Contraction (or recession)
  - Recovery
- Unemployment refers to a situation where the persons who are able to work and willing to work fail to secure work or activity which gives them income or a means of livelihood.
- Frictional unemployment is temporary unemployment which exists during a period of the transfer of labour from one occupation to another.
- Structural unemployment refers to a situation in which workers become jobless due to loss of demand for labour in particular regions or industries.
- Unemployment which arises due to inadequate overall demand associated with the downswing, recession or depression period of a trade cycle is called cyclical unemployment .

- Involuntary Unemployment refers to a situation in which the workers are willing to work under any conditions and at any wage rate but they fail to get employment.
- Voluntary Unemployment: When the economy offers employment opportunities to workers, but they themselves are not willing to take up jobs because employment conditions, such as wage rate, location, promotional avenues, physical environment, attitude of the employer, etc., do not suit them.
- Unemployment is usually measured as the ratio of the number of unemployed persons to the total labour force in a country and is expressed in percentage terms. Thus:

$$\text{Rate of Unemployment} = \frac{\text{No. of unemployed persons}}{\text{Total labour force}} \times 100$$

- Adverse economic effects of unemployment are: 1. Loss of valuable human resources, 2. Increase in poverty, 3. Demoralising effect, and 4. Exploitation of labour.
- Inflation is generally described as a situation characterised by a sustained increase in the general price level.
- When the demand for goods and services exceeds the available supply at current prices, it is a demand-pull inflation .
- Inflation resulting from rising costs of production and slack resource utilisation is called cost-push inflation .
- Demand-pull and cost-push Inflation go together in an economy.
- Rate of inflation measures the extent of increase in general price level over time. It is usually measured as the percentage change in the general price level from one year to the other.

$$\text{Rate of inflation (year t)} = \frac{\text{CPI (year t)} - \text{CPI (year t} - 1)}{\text{CPI (year t} - 1)} \times 100$$

- A moderate inflation is generally believed to be a necessary condition of economic growth. Inflation leads to a shift in real incomes, provides encouragement to investment, and can be used as a tool to raise the level of savings. However, inflation may also retard economic development in a number of ways. It may: lead to lopsided development; lead to increased consumption and have a negative effect on savings; have an adverse effect on the balance of payments; and introduce uncertainty and instability. It may be noted that unchecked inflation may change into hyperinflation.
- A budget shows the details of the planned expenditures of government program and the expected revenues from tax and non-tax sources for a year.
- General objectives of a budget are:
  - Economic growth
  - Reduction of poverty and unemployment

- Reallocation of resources
- Reduction of inequalities
- Price stability, and
- Management of public enterprises.

- A budget is said to be balanced if the government revenues and expenditures are equal; it is said to be a surplus budget if the government revenue exceeds its expenditure; and, it is said to be a deficit budget when the government expenditure exceeds its revenue.
- Usually, budget is divided into two parts: Revenue Budget and Expenditure Budget.
- Revenue Budget forecasts the total revenue collections of the government from tax and non-tax sources.
- Revenue budget has three parts:
  - Ordinary Revenue
  - Capital Revenue
  - External Assistance, and
- Ordinary Revenue is made up of tax revenue and non-tax revenue.
- Tax revenue has three parts:
  - Direct tax
  - Foreign trade tax.
  - Indirect tax
- Non-tax Revenue is the revenue collected by the government from sources other than tax. These include income of the government by way of sale of goods and services by various departments of the government.
- Grants received in cash, or in some other form, from outside the country, are known as external assistance.
- Capital revenue comprises the money received by the government from sale of government assets, collection of loans, counterpart fund and external loans.
- Expenditure budget is a forecast of the total expenditure, by the government in a year.
- Expenditure budget has two parts:
  - Recurrent Expenditure
  - Capital Expenditure.
- Recurrent expenditure represents expenses made by the government which are recurrent in nature, i.e., they are repeated. Normally, it is expenses on consumables that facilitate productive activities.
- Capital expenditure represents expenses made by the government for implementation and expansion of development projects. These are in the nature of the acquisition of fixed assets like buildings, machinery, equipment, etc.
- The annual budget for the Federal Government of Ethiopia is prepared by the Ministry of Finance and Economic Development (MoFED) and the budgets for the regional governments by the respective regional finance bureaus.

REVIEW EXERCISE FOR UNIT 6

I Write detailed answers to the following questions.

1 Define macroeconomics and discuss its major concerns.

2 Explain the general objectives of a macroeconomic policy.

3 What are the central problems of macroeconomics?

4 What do you mean by a business cycle? Describe the four main phases into which a business cycle is usually divided.

5 Discuss the characteristic features of a business cycle.

6 Explain the various causes of a business cycle.

7 What do you mean by unemployment? How is it measured?

8 Discuss the concepts of frictional, structural and cyclical unemployment with the help of examples.

9 Explain the impact of unemployment on economic growth. Also describe social costs of unemployment.

10 Explain the concept and causes of inflation. In particular, differentiate between demand-pull inflation and cost-push inflation.

11 How is the rate of inflation for a particular year calculated by making use of the concept of Consumer Price Index?

12 How does inflation affect the economic growth of a country? As part of your explanation, identify the favourable/adverse effects of inflation.

13 Discuss the meaning and general objectives of a government budget.

14 Explain how a difference between the receipts and expenditures of the government gives rise to deficit or surplus budgets. Point out the methods usually adopted for financing a deficit budget.

15 Explain the various components of a government budget with specific reference to the case in Ethiopia.

II Differentiate between the following:

16 Ordinary revenue and capital revenue

17 Direct taxes and indirect taxes

18 Recurrent expenditure and capital expenditure

19 Deficit budget and surplus budget

20 Boom and depression

III Write 'True' or 'False' for each of the following:

21 A macroeconomic policy aims to achieve full employment in an economy.

22 There is economic over-optimism during the period of depression in an economy.

23 Periodicity between the business cycles is always the same.

24 Frictional unemployment is a temporary unemployment.

25 Unemployment leads to exploitation of labour.

26 During inflation the prices of all goods and services rise together.

27 When the demand for goods and services exceeds the available supply, we call it cost-push inflation.

28 A moderate inflation is a necessary condition for economic growth.

29 Inflation has a positive effect on balance of payments.

30 If the receipts of the government are more than its expenditure, we call it a surplus budget.

IV For each of the following, four choices are given, but only one out of them is correct. Choose the correct one.

31 The phase of business cycle during which business confidence in the economy is at its lowest is known as:

A Peak
C Recovery
B Depression
D Contraction

32 Labour force consists of all those:

A who are fit for work
B who are willing to work
C who are available for work
D all of the above

33 Which one of the following is a capital expenditure of the government?

A payment of pension
B payment of subsidies on production
C purchase of machinery
D grants

34 Which one of the following is a recurrent expenditure of the government?

A payment of salaries
B purchase of buildings
C purchase of machinery
D loans granted to a state government

35 Which of the following is a direct tax?

A excise tax
B income tax
C stamp duty
D sales tax

36 Which of the following is an indirect tax?

A dividend tax
B income tax
C sales tax
D business tax

37 Which one of the following is a tax revenue of the government?

A custom duty
B fines
C pension contribution
D fees

V Match the following.

38	Demand exceeds the available supply	A	overoptimism in business
39	Boom	B	more workers engaged in a work that actually required
40	Temporary unemployment	C	demand-pull inflation
41	Personal income tax	D	excise tax
42	Indirect tax	E	frictional unemployment
43	Disguised unemployment	F	direct tax

VI Write very short answers to the following.

44 Mention two fundamental concerns of macroeconomics.

45 Mention any three objectives of a macroeconomic policy.

46 With what types of problems is macroeconomics is concerned?

47 List the names given to four phases of a business cycle.

48 List two causes of recession.

49 Name three types of unemployment.

50 What is disguised unemployment?

51 Name two sectors of an economy where seasonal unemployment is common.

52 Mention two adverse effects of unemployment.

53 Is inflation necessary for economic growth?

54 List two favourable effects of inflation.

55 List two adverse effects of inflation.

56 What are the three components of tax revenue?

57 Give two examples of direct taxes.

58 Give two examples of recurrent expenditure of a government.

59 Calculate the unemployment rate for a country with the following profile.

a The number of employed persons 24 million

b The number of unemployed persons who are actively seeking for employment is 10 million.

c The total number of the labor force equals to 34 million.

60 Based on the following data calculate inflation rate in the years, 2009 and 2010. Assume the basket of goods to a typical consumer in a country is composed of two goods teff and meat. His/her annual consumption is 200 kg teff and 20 kg of meat.

Year	Price of teff per kg (in Birr)	Price of meat per kg (in Birr)
2008	3	40
2009	5	45
2010	8	52

7

Unit Objectives

After completing this unit, you will be able to:

- appreciate national income account and its importance;
- understand and compute the different approaches used to measure GDP; and
- analyse the difference between nominal and real GDP.

Main Contents

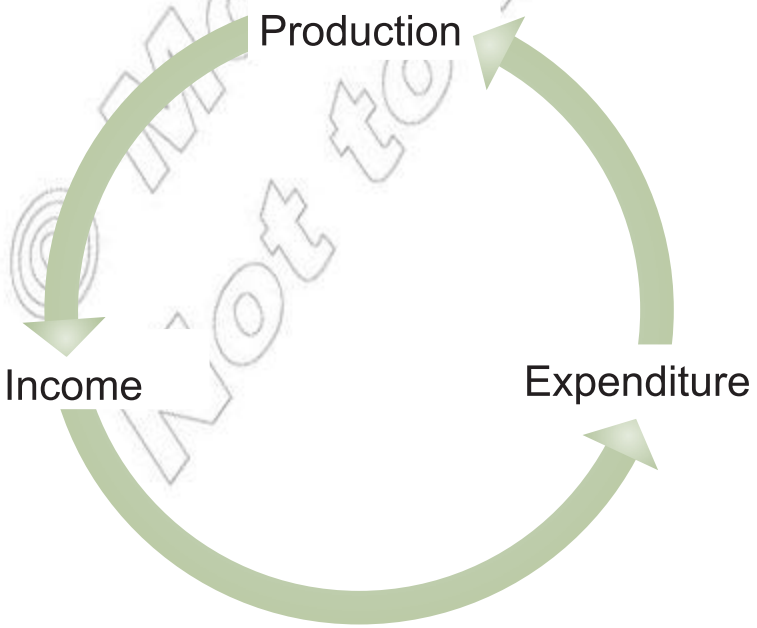
7.1 NATURE AND MEANING OF NATIONAL INCOME ACCOUNT

7.2 GDP (GROSS DOMESTIC PRODUCT)DEFINITION AND ITS MEASUREMENT

7.3 OTHER NATIONAL INCOME ACCOUNT

7.4 GDP AND INCOME DISTRIBUTION

- Unit Summary
- Review Exercise



INTRODUCTION

National income is often considered as the most comprehensive measure of how well an economy is performing. It is necessary and important, therefore, to measure the national income of a country so as to have an idea of the performance of the economy. Measuring national income is an extremely complicated large task. However, economists have devised various ways of estimating national income. In fact, national income estimates are made in every country these days. In Ethiopia, the task of estimating national income is entrusted with the Central Statistical Organisation (CSO), that works in collaboration with ministry of finance. In this unit we discuss the various concepts related to national income accounting and the methods of measuring national income.

7.1 NATURE AND MEANING OF NATIONAL INCOME ACCOUNT

At the end of this section, you will be able:

- define and state national income account and its importance; and
- define GDP and GNP.

Key Terms and Concepts

- National income
- Gross Domestic product (GDP)
- Gross National Product (GNP)
- Net factor income from abroad

Start-up Activity

A personal income looks easy to know. What about income of a nation? What constitutes incomes of a nation?

National Income Features

National income is an essential element in the study of macroeconomics. It is broadly defined as the aggregate monetary value of all the final goods and services produced in a country during a year. Based on this definition, we can identify the following main features of national income:

- National income is counted for a period of one accounting year,
- National income is a flow concept. National income is a measure of the flow of goods and services during a year,

- We include only final goods and services in the calculation of national income. Intermediate goods are not included in the calculation of national income,
- National income is expressed in terms of monetary value of goods and services.

Note that national income is also defined as the sum of factor incomes in a country in a year's time and is sometimes expressed in terms of aggregate expenditure of a country in a year's time.

Importance of National Income Accounting

National income accounting is a method of preparing and presenting national income accounts based on the principle of double entry system of business accounting.

Preparation of national income accounts is important for the formulation of economic policies and also as a measure of economic growth. Moreover, national income accounts reveal information about production activities in the different producing sectors of an economy. We list below some reasons for which national income accounts are important

- Indicator of Economic Progress: Particularly in underdeveloped economies, the State has to actively participate in various programs of development, and for that it has to formulate economic policies. For the formulation of plans and determination of priorities, it has to estimate national income data. In economic planning, it is also essential to collect information about the national income, savings.
- Investment, consumption, employment, etc. All these estimates require data relating to national income. National accounts are also helpful in the assessment of various programs of development.
- Significance in Business Policy Making: National income data are also needed for formulation of policies in different businesses. Individual firms are always interested to know the contribution to national income by the particular industry to which they belong. National income statistics also provide information to business firms about the nature and extent of demand of various products in the market.
- Significance for Trade Unions: National income accounts are of great use to trade unions and labour organisations. National income data provide information about the contribution of the labour force to the gross national product and the wages and salaries received by the workers.

- **Measure of Economic Growth:** National income accounts are used to measure the rate of economic growth. These accounts reveal the trend of output, income, consumption and capital formation during a given period of time.
- **Comparison with other Countries:** National income accounts help in international comparisons. On the basis of national income, one can easily say whether a country is developed or underdeveloped. By analysing the national income statistics of the developed countries, the developing countries may change their strategy of development.
- **Knowledge of Structural Changes:** National income accounts reveal the structural changes taking place in an economy. It gives information about the relative importance of different sectors of the economy and shows the distribution of income among various producing sectors.
- **Significance for Economic Analysis:** National income is an important concept of economic theory. Study of national income accounts is essential to identifying interrelationships between different sectors of an economy.

We may thus conclude that national income accounts are very useful for measuring economic growth and formulating economic policies.

Activity 7.1

"National income accounting is important for every nation – developed, developing or underdeveloped— in spite of its limitation that it does not indicate the real economic welfare of the people and the loss to the nation because of environmental damages". Discuss the statement in a group and identify the major uses and limitations of national income accounting. Prepare a report on your discussions.

7.2 GDP GROSS DOMESTIC PRODUCT AND GNP GROSS NATIONAL PRODUCT DEFINITION AND MEASUREMENT

At the end of this section, you will be able to:

- identify the problems associated with measuring GDP;
- identify and define the three approaches that are used to measure GDP;
- define and compute GDP based on product approach;

- define and compute GDP based on the expenditure approach;
- define and compute GDP based on the income approach;
- define concept of GDP; and
- distinguish the difference between nominal and real GDP.

Key Terms and Concepts

- Nominal GDP
- Real GDP
- Grean GDP
- Depreciation
- Double counting
- Intermediate goods

Start-up Activity

Is everything being produced in Ethiopia belongs to the country? Why measuring national income is not as easy as measuring personal income. Why? Discuss.

Various aggregates and concepts concerning domestic income and national income are used in national income accounting. All these concepts have their own relevance. We discuss below two of the most important aggregates related to domestic income and national income.

Gross Domestic Product

Gross Domestic Product (GDP) is the market value of all the final goods and services produced within the domestic territory of a country during a year

In order to understand the meaning of GDP, note the following points:

- Gross MeasureIt is an aggregate measure. It measures gross value of the products.
- Market value: GDP measures the value of goods and services at their Market Price. Hence it is also termed as Gross Domestic Product at market prices (GDP_{MP}).
- New Production: GDP includes the value of output produced in the "new" current accounting year only. It does not account for the value of existing or old goods.
- GDP includes only the value of final goods and services, i.e., finished products only: It does not take into account the value of intermediate goods, such as raw materials, power, fuel, etc. We differentiate between intermediate and final goods as follows:

- Intermediate goods – Goods which are used for further production by passing through some production process as secondary inputs are called intermediate goods. Goods which are used for resale in the same year are also included in intermediary goods. For example, cotton for the thread manufacturing mill, thread for the cloth mill and cloth for the ready made goods lying with wholesalers and retailers for resale in the same year are also intermediate goods.
- Final goods – Goods which are used either for final consumption by the consumers or for investment by the producers are called final goods. For example bread, butter, biscuits, milk, clothes, shoes, watches, radios, etc. used by the consumers, and also machines and tractors used by the producers are final goods or finished goods.

- In Gross Domestic Product, we include only the goods and services produced within the domestic territory of a country. It includes the incomes locally earned by the non-nationals and excludes the incomes received by the resident nationals from abroad.

Gross National Product

Gross National Product (GNP) is the money value of all final goods and services produced in the domestic territory of a country during a year plus net-factor income from abroad minus factor income of non residents in domestic territories

We may say it is the Gross Domestic Product at market price plus NFI (net factor income from abroad minus factor income of non-residents in domestic tertiary).

Thus,

$$GNP_{MP} = GDP_{MP} + NFI \quad (7.1)$$

Where, GNP_{MP} = Gross National Product at market prices

GDP_{MP} = Gross Domestic Product at market prices

NFI = Net Factor Income

NFI is the difference between factor income flowing out of the country and flowing into the country. Alternatively, it is the difference between the factor income by a country's citizen living abroad and the factor income earned by non-residents (foreigners) in the domestic territory of that country.

NFI = Factor income earned from abroad by residents
– factor income of non-residents in domestic territory. (7.2)

Net factor income from abroad can be positive or negative. When net factor income from abroad is positive, domestic product is smaller than the national product (or the national product is greater than the domestic product). And when net factor income from abroad is negative, domestic product is greater than the national product.

Approaches to Measuring GDP

There are three different phases in circular flow of national income production, income and expenditure. Production of goods and services is the result of combined efforts of factors of production (land, labour, capital and enterprenuers). The net output emerging from the production process gets distributed in the form of money income (rent, wages, interest and profit) among factors of production. With this income factors of production we purchase goods and services for final consumption and investment. In this way income creates expenditure. Expenditure in turn gives rise to further production. This leads to continuous circular movement of production, income and expenditure.

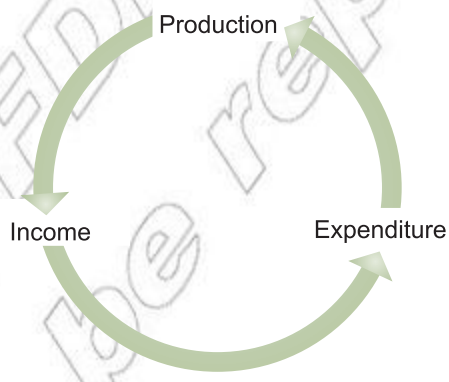


Figure 7.1: Circular Flow of Production, Income and Expenditure

We can look at national income from three angles – as a flow of goods and services, as a flow of income or as a flow of expenditure. Accordingly, there are three methods of measuring national income as shown below in Figure 7.2

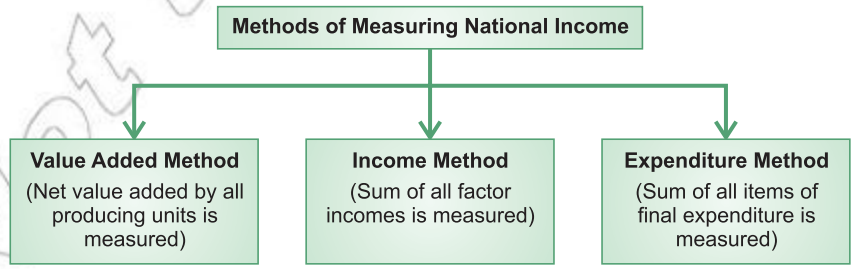


Figure 7.2: Methods of measuring national income

Note:

Since the above three methods are only different view points of the same flow of goods and services, totals from each method should therefore be equal to each other.

We now discuss each of these three methods one by one.

I Production Method (Value Added Method)

In this method two approaches – 'Final Product Approach' and 'Value Added Approach' – are adopted.

i Final Product Approach: According to this approach, in the estimation of GDP, we include the market value of all final goods and services produced in a country. For example, if we manufacture thread from cotton, cloth from thread and shirts from cloth, here shirts are the final good. Hence, we should include the value of shirts only in the calculation of national income.

Thus, GDP is calculated by multiplying all the final goods and services produced in a country with their respective market prices.

$$GDP_{MP} = P(Q) + P(S) \qquad (7.3)$$

Where, P = Market price
Q = Quantity of goods
S = Quantity of services

Problem of Double Counting in the Final Product Approach: The final product approach cannot be used in actual practice because production is a continuous process and in this process it is difficult to know the final product. It gives rise to the problem of double counting. What is the problem of double counting? Counting the value of a commodity more than once in the measurement of national income is called double counting. So far as an individual enterprise is concerned, it considers its output as final product. For example, for a farmer, cotton is a final product, for a spinning mill, thread is a final product, for a cloth-mill, cloth is a final product, and for a garment manufacturer, shirts are a final product. All these enterprises take the sale value of their products as the value of their final output. When we

© MoE: FDRE Ethiopia Not to be republished

take into account the sum total of the value of output of all these individual enterprises in the estimation of national income, it suffers the problem of double counting. This leads to overestimation of the value of goods and services produced.

To overcome the difficulty of double counting, the value added approach is used.

ii Value Added Approach: The value added approach measures the value added (contribution) by each producing enterprise in the production process in the domestic territory of a country in an accounting year. Value added is defined as the difference between total value of the output of a firm and the value of inputs bought from other firms. Clearly, the value added approach measures the contribution of each producing unit in the domestic economy without any possibility of double counting.

The following steps are involved in estimating national income by the value added approach:

- Identifying all the producing units in the domestic economy and classifying them into three economic sectors: primary, secondary and territory sectors. (The primary sector exploits natural resources, the secondary sector transforms one type of commodity into another, and the tertiary sector renders services.),
- Estimating the value added by each producing unit. (By deducting intermediate consumption, from value of output, we get the value added.),
- Estimating the value added of each economic sector by summing up the value added of all producing units falling in each industrial sector,
- Computing GDP_{MP} by adding up the value added of all economic sectors.
- Estimating net factor income from abroad, which is added to GDP_{MP} to obtain GNP_{MP}.

Example: GDP by final product approach.

The final productions of a hypothetical nation is given by the following table. The table shows how GDP is calculated using final product and current prices.

	Product	Quantity (millions)	Price (per 1 unit)	Birr value (millions)
Goods	Shoes	1	250	250
	Cars	2	75,000	150,000
	Bed	10	900	9,000
Services	Haircuts	24	10	240
	Legal advice	2	3,000	6,000
	Medication	5	750	3,750
				GDP: 169,240

II Income Method

The income method measures national income from the side of payments made to the primary factors of production in the form of rent, wages, interest, and profit for their productive services in an accounting year. Since the income of factors of production is cost to their employers, so factor income and factor cost are the same. Thus if the factor incomes of all the producing units generated within the domestic economy are added up, the resulting total will be the domestic income at factor cost. If we add the value of depreciation and indirect taxes to this, we get GDP_{MP}. Adding further net factor income from abroad gives us GNP_{MP}.

Remarks:

1 Depreciation means loss of the value of fixed capital assets during production. In other words, depreciation is the value of existing capital stock that has been consumed (used up) in the process of producing output.

Fall in the value of fixed assets due to normal wear and tear and to expected obsolescence is called consumption of fixed capital or depreciation.

2 Taxes which are levied by the government on production and sale of commodities are called indirect taxes for example, excise duty, sales tax, custom duty, etc. The buyer of a taxed commodity pays the tax indirectly because the tax is included in the price which the buyer pays. The effect of indirect tax is that it increases the price of a commodity.

The following steps are involved in estimating national income by the income method.

- Identifying enterprises which employ factors of production (land, labour, capital and enterprenurship),
- Classifying various types of factor payments like rent, wages, interest and profit,
- Estimating the amount of factor payments made by each enterprise,
- Summing up of all factor payments made within the domestic territory to get the domestic income at factor cost,
- Adding the value of depreciation and indirect taxes to domestic income at factor cost to get GDP_{MP},
- Estimating net factor income from abroad, which is added to GDP_{MP} to obtain GNP_{MP}.

To correctly compute national income by the income method, the following precautions need to be taken.

- Only factor incomes which are earned by rendering productive services are included. All types of transfer income are not included.
- Imputed rent of owner-occupied dwellings and the value of production for self-consumption are included, but the value of self-consumed services is not included.
- Income from illegal activities like smuggling, black marketing, etc., as well as windfall gains from lotteries, etc., are not included.

Example:

GDP at market price measured by income approach, of a hypothetical nation.

Types of Income	Amount (in millions Birrs)
Compensation of employes	84,000
Rental income	9,200
Interest income	12,100
Profits (properietor's income)	30,000
Depreciation	10,000
Indirect business taxes	4,000
	GDP: 149,300

III Expenditure Method

The expenditure method gives us the value of GDP at MP when measured at the point of expenditure. From the expenditure point of view, GDP is gross expenditure on the final use of domestically produced goods and services during

a period of account. Basically the final use of goods and services is for two purposesconsumption purposesfor direct satisfaction of wants, andinvestment purposesfor expanding productive capacity. And expenditure on them is called final consumption expenditure and final investment expenditure. They are further subdivided into five components as shown below. Total final expenditure is equal to GDP at MP.

$$GDP_{MP} = \text{Private final consumption expenditure + government final consumption expenditure + gross fixed capital formation + change in stocks + net exports} \quad (7.5)$$

Example:Calculating GDP by expenditure approach

Expenditure		Amount (in millions of Birr)
1. Personal final consumption expenditure	4,500	
Durable goods	1,500	12,000
Non durable goods		
Services	6,000	
2. Government final consumption expenditure	1040	
Federal defence	2100	5440
Federal non-defence		
State and local governments	2300	
3. Gross fixed capital formation (Gross private Domestic Investment)	3,940	
Construction Expenditure	2,200	7410
Machinery equipment Expenditure (Business fixed investment)		
Changes in inventories	1,270	
4. Net Exports	94	
Exports		-111
Imports	205	
		GDP: 24,739

We discuss briefly each of these components:

- Private final consumption expenditure:It measures the money value of goods and services purchased by households for current use during a time period. In this category we include consumption expenditure by consumer households on all types of consumer goods (i.e., durable, semi-durable, and nondurable goods and services).

- Government final consumption expenditure: It is defined as "Current expenditure on goods and services incurred in providing services of government administrative departments less sales." It is incurred by general government to satisfy collective needs of the people. For example, government expenditure on health, education, general administration, law and order, etc. belongs to this category.
- Gross fixed capital formation: Expenditure on it consists of mainly two items
  - Construction, and
  - Machinery and equipment.
- Change in stocks: This refers to the physical change in stocks of inventories like raw material, semi-finished goods and finished goods lying with the producers for smooth working of production processes. It is the difference between the stocks in the beginning of and at the end of the accounting year. (inventories or unsold outputs).
- Net exports (exports less imports): This refers to the difference between the va of exports and value of imports. Note th exports and imports include both materi goods as well as services.

> **Note:**
>
> Change in stocks is sometimes taken as a part of gross fixed capital formation.

We may thus sum up as follows:

$$GDP_{MP} = C + Ig + G + (X - M) \qquad (7.6)$$

Where, C = Consumption expenditure by households

Ig = Gross Investment expenditure by firms

G = Government expenditure on goods and services

X – M = Net exports

Also, $GNP_{MP} = GDP_{MP} + NFI$

The following precautions need to be taken to correctly estimate national income by the expenditure method:

- To avoid double counting, expenditure on all intermediate goods and services is excluded.
- Government expenditure on all transfer payments, such as scholarships, unemployment allowances, old age pensions, etc., is excluded because non-productive services are rendered by the recipients in exchange.

- Expenditure on purchase of second-hand goods is excluded from national income because this type of expenditure is not on currently produced goods.
- Expenditure on purchase of old shares/bonds or new shares/bonds etc. is excluded because it is not payment for goods or services currently produced. It shows mere transfer of property from one person to another.

Problems in Measuring GDP

We face a number of problems or difficulties in the estimation of national income, especially in under-developed countries like Ethiopia. These various problems are of generally two types: conceptual problems and statistical problems.

Conceptual Problems

- Product, income or expenditure – Which method should be selected and which is more appropriate – it is a constant problem for enumerators to solve.
- Opinions differ regarding the meaning and definition of national income.
- There is no clear-cut demarcation between productive and non-productive activities. There are a number of activities regarding which opinions differ regarding whether they should be treated as productive activities or not. For instance, production for self-consumption, services rendered without remuneration, services of an artist, etc.
- In developed and under-developed countries, the same pattern for the computation of national income should not be adopted. But in under-developed countries, we generally adopt the pattern suggested by the U.N.O., which may be quite suitable for developed countries but difficult to follow for an under-developed country.

Statistical (or Practical) Problems

- Non-availability of data: We do not have proper and reliable data regarding various activities of the economy. It is more difficult to have these data in under-developed countries.
- Barter system: In developing countries, even today a good part of exchange is performed through barter systems. It is very difficult to estimate the money value of this type of transaction.
- The problem of double counting: In actual practice it is very difficult to distinguish between intermediate goods and final goods. Therefore, sometimes the value of intermediate goods enters into our calculation of national income. It poses the problem of double counting.

- Production for self-consumption: In developing countries like Ethiopia, a good part of production is kept for self-consumption. It is very difficult to estimate the quantity and value of this production for self-consumption.
- Non-maintenance of accounts: In developing countries small unincorporated enterprises and self-employed persons do not maintain their accounts properly. Thus it is difficult to get accurate information about their contribution to national income.

Nominal and Real GDP

We have seen that GDP is, broadly, the market value of final goods and services produced. It can be measured in two ways: at current market prices and at constant prices. When final goods and services included in GDP are valued at current market prices, i.e., prices prevailing in the year for which GDP is being measured then it is called GDP at current market prices or Nominal GDP. For example, Nominal GDP of 2009 is the value of output produced in 2009 calculated at the market prices prevailing in 2009.

On the other hand, when goods and services included in GDP are valued at constant (fixed) prices i.e., prices of the base year it is called GDP at constant prices or Real GDP. Constant prices refer to prices prevailing in some carefully chosen year called the base year.

Significance of the Distinction

1 Real GDP (i.e., at constant prices) truly reflects the performance and level of economic growth in an economy, whereas Nominal GDP (i.e., at current prices) does not. Nominal GDP is affected by two factors:

- Change in physical output, and
- Change in prices. If current market prices rise fast, Nominal GDP will also rise fast even though physical output remains the same.

In contrast, real GDP is affected by only one factor, change in physical output because prices are fixed or constant. Thus real GDP can rise only when there is a rise in physical output during a year. A country is interested in change in physical output (real GNP) and not in monetary or Nominal GDP because an increase in real GDP leads to a rise in the standard of living of the people.

2 Real GDP is a better tool for making a year-to-year comparison of changes in the physical output of goods and services. A sustained rise in real GNP reflects the economic growth of the country, whereas a continuous fall in real GDP is an indicator of recession, and depression.

3 Real GDP is often used in making international comparisons of economic performance across countries.

Conversion of Nominal GDP into Real GDP

An increase in Nominal GDP does not necessarily mean an increase in the physical output of goods and services because the said increase might have been due to an increase in prices. Therefore, to eliminate the effect of price increase and to know the real change in physical output, Nominal GDP is converted into real GDP, using the following formula:

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Index of Current Year}} \times 100$$

Example:

Using the following data about a hypothetical nation, calcualte Real GDP for the nation in the years 2000, 2001, 2002, 2003.

No	Year	Nominal GDP (Birr)	CPI
1	2000	360 billion	100
2	2001	420 billion	140
3	2002	520 billion	200
4	2003	570 billion	300

Solution:

No	Year	Nominal GDP (Birr)	CPI	Real GDP $= \frac{\text{Nominal GDP}}{\text{Price Index of Current Year}} \times 100$
1	2000	360 billion	100	360 billion
2	2001	420 billion	140	300 billion
3	2002	520 billion	200	260 billion
4	2003	570 billion	300	190 billion

Note that real GDP is decreasing while the nominal GDP is increasing. This is happening due to higher level of consumer's price index.

Activity 7.2

1 We understand that, while estimating national income, only the income from productive activities is to be included and not that from unproductive activities. Try to identify the main features which make a distinction between productive activities and unproductive activities.

2 Discuss the difference between GDP and GNP.

3 Supposing a person marries his own maid. What do you think the effect will be on the value of GDP?

4 Do you think, in a closed economy, GDP and GNP are equal?

5 Identify and list as many examples of transfer payments as you can.

6 How can we say that the sum of value added is equal to the sum of factor incomes?

7 On the basis of the following information, calculate Gross National Product (in million Birr):

- a GDP = 50,720. Net factor income from abroad = 2,400.
- b GDP = 1,20,720. Income receivable from abroad = 4,720. Income payable to foreign countries = 5,830.

8 Explain why real GDP is a better indicator of economic growth than.

9 Calculate, by the income method, GDP at MP from the following data (in million Birr):

- a Government final consumption expenditure = 7,351
- b Mixed income of self-employed = 28,267
- c Gross domestic fixed capital formation = 13,248
- d Change in stock = 3,170
- e Event, interest and profit = 9,637
- f Private final consumption expenditure = 51,177
- g Net factor income from abroad = (–) 255
- h Indirect taxes = 8,834
- i Depreciation = 4,046
- j Imports = 5,674
- k Exports = 4,812
- l Compensation of employees = 24,420

10 Draw a diagram that shows the inter-relationships among various aggregates of national and domestic income on the basis of the following:

- a Net Factor Income from Abroad (NFIA)
- b Depreciation
- c Indirect taxes

11 Draw a box diagram which indicates the components of the following:
- a Domestic income
- b National income
- c Personal income
- d Draw this diagram on chart paper for display in your classroom.

12 In a group, discuss how the following should be treated (included or excluded) while estimating national income.
- a Services of owner occupied houses.
- b Profit earned by foreign banks in Ethiopia.
- c Rent, received by Ethiopian residents, from buildings rented out to the foreign embassies in Ethiopia.
- d Sale of an old car.
- e Windfall gains.
- f Money received from sales of shares.
- g Commission received by a property dealer from the buyer and from the seller of a house.

Prepare a report on your discussion.

7.3 OTHER NATIONAL INCOME ACCOUNT

At the end of this section, you will be able to:

- explain other national income account.

Key Terms and Concepts

- Net domestic product
- Net national product
- Personal income
- Corporate tax
- Personal disposable income

Start up Activity

GDP is not the actual measure of national income. How should the net income of a country be calculated?

As mentioned in the introduction to the preceding section various aggregates and concepts concerning domestic income and national income are used in national income accounting. We have discussed in detail the meaning and measurement of two out of them – GDP and GNP. The following sections give a brief introduction to some other concepts relating to national income.

Net Domestic Product at Market Prices (NDP_{MP})

Net Domestic Product at market prices is the net market value of all the final goods and services produced in the domestic territory of a country during a year.

The net market value of goods and services is equal to the market value of the goods and services minus depreciation.

Thus, Net Domestic Product at market prices is equal to the Gross Domestic Product at market prices minus depreciation or capital consumption allowance.

$$NDP_{MP} = GDP_{MP} - \text{Depreciation} \quad (7.8)$$

Net National Product at market Prices (NNP_{MP})

Net National Product at market prices is the net market value of all the final goods and services produced by the normal residents of a country during a year.

It can be calculated in two ways:

- NNP_{MP} can be obtained by subtracting depreciation from GNP_{MP}. Hence,

  $$NNP_{MP} = GNP_{MP} - \text{Depreciation}$$

- NNP_{MP} can also be obtained by adding net factor income from abroad to the Net Domestic Product at market prices (NDP_{MP}). Hence,

  $$NNP_{MP} = NDP_{MP} + NFI$$

Net National Product at Factor cost (NNP_{FC})

Net National Product at factor cost is the sum total of net value added at factor cost by all the normal resident producer enterprises of a country during a year.

It is for NNP_{FC} that we use the term national income (NI). NNP_{FC} or NI represents payments made to the factors of production as wages, rent, interest and profits. In short, NI is the sum total of all factor payments. NNP_{FC} or NI can be obtained by subtracting indirect taxes from net national product at market prices. Hence,

$$NNP_{FC} \text{ or } NI = NNP_{MP} - \text{Indirect taxes.} \quad (7.9)$$

Personal Income (Y)

Personal income is the sum of earned income and transfer income received by persons (households) from all sources within and outside the country

The point to be noted here is that personal income includes not only factor incomes which are earned from productive services but also transfer incomes (or payments) which are received without rendering any productive service. It is a receipt concept as compared to national income, which is an earning concept.

Note that national income is not the sum total of personal incomes, since the former includes only earned incomes, whereas the latter includes earned incomes as well as transfer incomes. Again, personal income is different from national income because two components of national income, namely, corporate tax and undistributed profit of corporate enterprise are not included in personal income. The reason is that corporate tax goes to the government and undistributed profit is retained by the company — i.e., these two are not received by households.

Put in the form of an equation:

$$\text{Personal Income (Y)} = \text{NI} - (\text{Corporate tax} + \text{Undistributed profit} + \text{All types of transfer incomes}) \quad (7.10)$$

Personal Disposable Income (Y_d)

Personal disposable income is that part of personal income which is available to the households for disposal as they like

Alternatively it is the income which remains with individuals after deduction of taxes and fees of the government. We can say, it is the income which the households can spend on consumption or can save as they please. Because households utilise personal disposable income for personal expenditure and personal savings, PDI is also equal to personal expenditure + personal savings. Personal disposable income can be arrived at by deducting personal taxes (like income tax, property tax, fire tax, etc.) from personal income. Thus,

$$\text{Personal Disposable Income } (Y_d) = \text{personal income (Y)} - \text{personal taxes} \quad (7.11)$$

Activity 7.3

1 Some basic terms introduced in this unit are listed on Page 270. Go back and review the definitions given for each term in the text. Then write the definition of each term on a separate sheet of paper, using your memory.

2 Discuss the two approaches used in the measurement of GDP by the production method.

3 Describe the problem of double counting in the measurement of GDP and how can we avoid it?

7.4 GDP AND INCOME DISTRIBUTION

At the end of this section, you will be able to:

- show the relationship between income and GDP.

Key Term and Concepts

- Green GDP

Start-up Activity

How do you explain the inequality of income distribution in many developing countries?

Economists have been using GDP as a principal measure of economic growth and development for a very long period of time. Hence increase in GDP is considered good and decrease in GDP is taken as bad for the economy. But nowadays a number of questions are being raised regarding development. When there is an increase in GDP, how it is distributed among different sections of the society or what happens to the distribution of income with the rise in GDP in a country? What is the effect of an increase in GDP on the natural resources of the country? What happens to the quality of life and human development with rises in income?

Thus, today and particularly in developing countries we are facing the problems of inequality of income distribution, environmental degradation, and the problems of pollution, deterioration in the quality of life, depletion of natural resources, and increasing unemployment. All these problems have created serious gaps between different sections of society in terms of their economic and social status. Not only that, they have also created gaps between nations.

Hence, we must be aware that mere increases in GDP does not provide guarantees of the economic welfare of the country and an equitable distribution of income. That is why some economists have suggested an alternative measure, which is called Green GDP.

Green GDP: Green GDP is defined as GDP which would help attain a sustainable use of natural environment and equitable distribution of benefits of

development. This concept is used to denote sustainable economic development i.e., development which should not cause environmental degradation (pollution) and depletion of natural resources, and should, at the same time, promote economic welfare for a long period of time.

Practical Work

1 From the following data about firm 'X' for the year 2009-10, calculate gross value added at MP during that year (in million Birr):

a Sales = 70
b Intermediate consumption = 40
c Opening stock = 15
d Closing stock = 10
e Depreciation = 15
f Wages and salaries = 10

Solution:

Value of output = Sales + Change in Stock
= 70 + (10 – 15) = 65 million Birr.

Gross value added at MP = Value of output – intermediate consumption
= 65 – 40 = 25 million Birr.

2 Calculate the values added by firm X and firm Y from the following data (in million Birr):

a Sale by firm X = 100
b Sale by firm Y = 500
c Purchases by households from firm Y = 300
d Export by firm Y = 50
e Change in stock of firm X = 20
f Change in stock of firm Y = 10
g Imports by firm X = 70
h Sales by firm Z to firm Y = 250
i Purchases by firm Y from X = 200

Solution:

Value added by firm X = (a) + (e) – (g) + (i)
Value added by firm X = 100 + 20 – 70 + 200 = 250
Value added by firm Y = (b) + (f) – (h) – (i)
Value added by firm Y = 500 + 10 – 250 – 200 = 60

3 From the following data, calculate GDP at MP (in million Birr):

a Value of output in primary sector = 2,000
b Intermediate consumption of secondary sector = 800
c Intermediate consumption of primary sector = 1,000

© MoE FDR Ethiopia Not to be republished

d Net factor income from abroad = – 30
e Net indirect taxes = 300
f Value of output in tertiary sector = 1,400
g Value of output in secondary sector = 1,800
h Intermediate consumption of tertiary sector = 600

Solution:

GDP at MP = Value added by primary sector
+ secondary sector + tertiary sector
= (2000 – 1000) + (1800 – 800) + (1400 – 600)
= 2800

4 On the basis of information given below, calculate GDP_{MP} (in Birr):

a Personal consumption expenditure = 45,000
b Government consumption expenditure = 5,000
c Gross domestic fixed investment = 5,000
d Increase in inventories = 1,000
e Exports of goods and services = 6,000
f Imports of goods and services = 7,000
g Net indirect taxes = 3,500
h Depreciation = 4,500

Solution: $C + Ig + G + (X - M)$, $Ig = c + d$

GDP_{MP} = (a) + (b) + (c) + (d) + (e) – (f)
= 45,000 + 5,000 + 5,000 + 1,000 + 6,000 – 7,000 = 55,000

5 From the following transactions, find out NNP_{MP} (in Birr):

a Household expenditure on consumption = 100,000
b Government expenditure on consumption = 12,500
c Gross capital formation = 25,000
d Depreciation = 6,000
e Exports = 6,000
f Imports = 9,000
g Net factor income from abroad = 750

Solution:

GNP_{MP} = GDP + NFI
GDP_{MP} = C + Ig + G +Nx
= 100,000 + 12,500 + 25,000 – 3,000 = 134,500
GNP_{MP} = 134,500 + 750 = 135,250
NNP_{MP} = GNP_{MP} – Depreciation = 135,250 – 6,000 = 129,250

© MoE Ethiopia Not to be republished

6 From the following data, calculate GNP at MP (in million Birr) by

i Income method, and

ii Expenditure method.

a Government final consumption expenditure = 250
b Change in stocks = 20
c Net domestic capital formation = 150
d Interest = 90
e Profits = 210
f Corporation tax = 50
g Rent = 100
h Factor income from abroad = 20
i Indirect taxes = 30
j Factor income to abroad = 40
k Exports = 60
l Imports = 80
m Consumption of fixed capital (depreciation) = 20
n Private final consumption expenditure = 500
o Compensation of employees (salaries) = 450
p Value of rent free accommodation to employees = 40

Solution:

i GNP_{MP} (by income method) = GDP_{MP} + NFI

GDP_{MP} = (d) + (e) + (g) + (i) + (m) + (o)

= 90 + 210 + 100 + 30 + 20 + 450 = 900

GNP_{MP} = GDP_{MP} + NFI = 900 – 20 = 880

ii GNP_{MP} (by expenditure method)

GDP_{MP} = (a) + (c) + (b) + (n) + Nx

= 250 + 150 + 20 + 500 + (–20) = 900

GNP_{MP} = 900 – 20 = 800

Activity 7.4

1 What is the relationship between GDP and economic welfare?

2 Does an increase in GDP indicate economic growth or development?

© MoE FDR Ethiopia Not to be republished

UNIT SUMMARY

- National income account is defined as the aggregate monetary value of all the final goods and services produced in a country during a year.
- Domestic product is defined as the value of all final goods and services produced by all the enterprises located within the territory of a country.
- National product refers to the amount of final goods and services produced by normal residents of a country.
- National product

  = Domestic Product + Net Factor Income.
- Net factor income is the difference between the factor income received from abroad and the factor income accruing to foreigners.
- National income (product) at market prices is the value of final goods and services produced in the economy, calculated at their market prices.
- National income (product) at factor cost expresses national income as the sum of all factor payments.
- Net Domestic Product = Gross Domestic Product – Depreciation.
- GDP_{MP} is the value of all final goods and services, at prices prevailing in the market, produced in the domestic territory of a country during a given year, inclusive of depreciation.
- $NDP_{MP} = GDP_{MP}$ – depreciation.
- GNP_{MP} is the aggregate market value of all final goods and services produced by normal residents of a country during a year.
- $GNP_{MP} = GDP_{MP}$ + net factor income.
- $NNP_{MP} = GNP_{MP}$ – depreciation.
- Transfer payments are payments received without any contribution to current output.
- Personal income is the income received by persons from all sources in the forms of factor income and current transfer payments.
- Personal disposable income is the income available to individuals to be used as they like:

  Personal Disposable Income = Personal Income – Personal Taxes

- Per capita income is average income of normal residents of a country in a particular year.
- National income at current prices (Nominal GDP) is the value of all final goods and services produced in a country during a particular year, expressed at market prices prevailing in that year.
- National income at constant prices (real GDP) measures the goods and services constituting the national income, in terms of the prices of the base year.
- Corresponding to three phases in the circular flow of income — production of goods and services, distribution of income, and expenditure of income – there are three methods of measuring national income: the value added method, income method and expenditure method.
- Value added method estimates national income as the sum total of the final output or net value added by all the producing units.
- Income method calculates national income by adding up all the incomes generated in the course of producing the national output.
- Expenditure method estimates national income by estimating the expenditure on final products.
- In terms of national income accounting, the three methods of estimating national income give the same magnitude of national income, i.e., 1 D W L R Q D O S U R G X F W K L Q F R P H J H Q H U D W H G K W R W D
- Problems in measuring GDP are generally of two types – conceptual problems and practical problems.
- Green GDP is defined as GDP which would help attain a sustainable use of the natural environment and the equitable distribution of benefits of development.

REVIEW EXERCISE FOR UNIT 7

I Write detailed answers to the following:

1 What do you mean by national income accounting? Explain the various reasons for which national income accounts are important.

2 Discuss in detail the concepts of Gross Domestic Product and Gross National Product.

3 “Production generates income, income generates expenditure, and expenditure in turn calls forth production” – Explain.

4 Discuss the two approaches used in the measurement of GDP by the production method.

5 Describe the problem of double counting in the measurement of GDP.

6 Describe the steps involved in the estimation of national income by the income method.

7 State precautions to be taken while estimating national income by the income method.

8 Discuss the various components of GDP in the expenditure phase.

9 State precautions to be taken while estimating national income by the expenditure method.

10 What are the various problems faced in measurement of GDP? Discuss in detail.

11 Explain the significance of the distinction between nominal and real GDP.

12 “Real GDP is a better indicator of economic growth” — Explain.

13 How is nominal GDP converted into real GDP? Explain with an example.

14 Discuss the concepts of personal income and personal disposable income.

II Distinguish between the following:

15 Final goods and intermediate goods

16 National income at current prices and at constant prices

17 Factor income and transfer income

18 Domestic income and national income

III Write 'True' or 'False' for each of the following:

19 Gross national product and gross national income are the same.

20 The concept of domestic product is related to the geographical boundary of the country.

21 Transfer income is included in personal income.

22 Sale proceeds of shares and debentures are part of national income.

23 National income calculated on the bases of the output method, income method, and expenditure method are different.

24 Windfall gain is a part of national income.

25 National product is equal to domestic product when net factor income from abroad is zero.

26 The National product of an economy is less than its domestic product when net factor income from abroad is negative.

IV Fill in each of the blanks with one of the following three words:

a Depreciation

b Net income taxes

c Net factor income from abroad.

27 NDP = GDP – _____

28 GDP = NDP + _____

V For each of the following, four choices are given, but only one out of them is correct. Choose the correct one:

29 If goods and services are valued at the prevailing price of the year, it will be a valuation at:

A constant price
B current price
C cost price
D extra ordinary price

30 Net exports will be negative if:

A exports exceed imports
B exports and imports are equal
C imports exceed exports
D none of the above

31 The sale of second-hand goods is not included in Gross Domestic Product because:

A it is not current-year production

B these goods are available at cheaper rates

C these goods are less useful

D these goods have a short life

32 A commission received by a broker on sale of second-hand goods will be included in GDP because:

A commission is being received in cash

B it is an income for the services rendered during current year

C broker services are very important

D commission adds to the price of goods

33 Indirect taxes are not included in national income because:

A they are not a factor income

B they are an income of lesser value

C they affect the price of goods

D they are income for the government

34 Income from theft, smuggling, pick-pocketing is not included in the national income because:

A they do not result in flow of income

B these are illegal activities

C these are anti-social activities

D these forms of income are easily earned

35 Pension and unemployment allowances are:

A transfer income

B generated income

C mixed income

D income earned

VI Write very short answers to the following.

36 Mention two uses of national income accounting.

37 Name different methods of measuring national income.

38 How can double counting be avoided?

39 What is an alternative name given to value added method?

40 What is final consumption expenditure?

41 Name the components of final consumption expenditure.

42 Why are exports included in national income?

43 Why are imports excluded from national income?

44 Why is income from smuggling not included in national income?

45 What is meant by net exports?

46 Do you include the value of retained goods for self-consumption in national income?

47 Why is imputed rent included in national income?

48 Write the relationship between GNP_{MP} and GDP_{MP} in equation form.

49 When is NDP be smaller than NNP?

50 When is NDP be greater than NNP?

51 What does the difference between NDP and NNP indicate?

52 Write the relationship between GDP and NDP in equation form.

53 What does consumption of capital imply?

54 How do we get Personal Disposable Income from Personal Income?

55 Name the alternative measure of GDP which takes into account the sustainable use of the natural environment.

56 Given the following information (in millions of Birr)

a government final consumption expenditure = 1400

b change in stocks = 210

c private final consumption expenditure = 820

d net domestic capital formation = 275

e exports = 175

f imports = 225

g depreciation = 80

h factor income to abroad = 78

i factor income from abroad = 194

Find

i GDP_{MP} by expenditure approach

ii NFI

iii GNP

iv NDP

v NNP

á

8

Unit Objectives

After completing this unit, you will be able to:

- realize the relationship among consumption, saving, and investment;
- compute average and marginal propensity to consume and save; and
- appreciate the role of investment in economic growth.

Main Contents

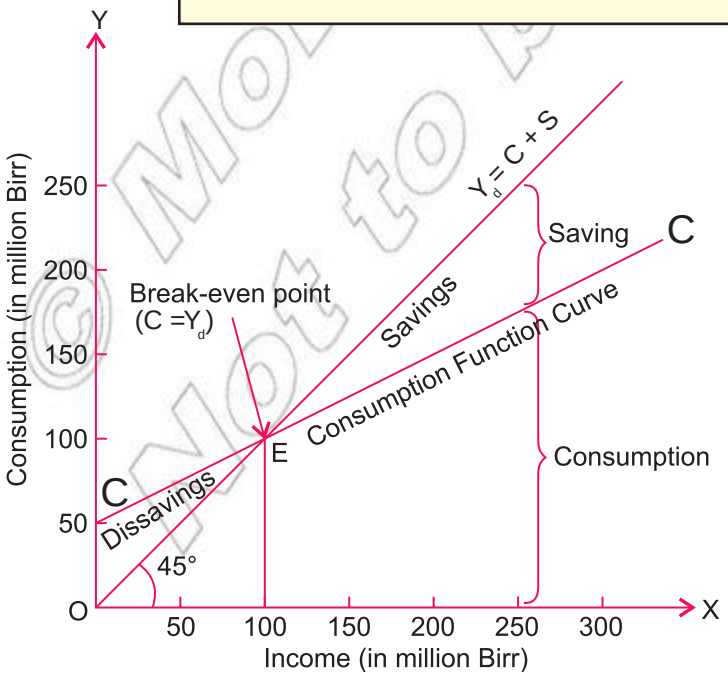
8.1 CONSUMPTION

8.2 SAVING

8.3 RELATIONSHIP BETWEEN CONSUMPTION AND SAVING

8.4 INVESTMENT

- Unit Summary
- Review Exercise



INTRODUCTION

The main purpose of every economic activity is consumption, whatever the type of economy. Most people spend the major part of their income on the consumption of goods and services. The balance of income which is not used for consumption is saved.

At the national level, developing countries spend a higher proportion of their income on consumption than do developed countries. Thus, developing countries save a smaller proportion of their income. A nation that saves a relatively small part of its income makes smaller investments and exhibits relatively lower rates of growth in productivity. On the other hand, nations that save and invest large parts of their income exhibit higher rates of growth in income and output.

From the above discussion, we can conclude that:

- Income, consumption, saving, and investment are closely interlinked.
- Consumption, saving, and investment are crucial factors in any country's economic performance (income, output, employment, etc.).

Earlier units briefly mentioned consumption and investment while discussing concepts such as aggregate demand and gross domestic product. This unit discusses consumption, saving, and investment in detail, emphasizing their roles in the economic growth of a country.

8.1 CONSUMPTION

At the end of this section, you will be able to:

- define the concept of consumption; and
- asses the basic determiners of consumption.

Key Terms and Concepts

- Income
- Consumption
- Saving
- Investment
- Marginal propensity to consume
- Average propensity to save
- Break-even point
- Personal disposable income

Start-up Activity

List down material consumptions you made in the previous week. Then compare your level of consumption with that of your friend. Are they similar or different? Why do you think they are similar or different?

As we know household consumption expenditure is one of the major components of aggregate demand or aggregate expenditure in an economy. We also know that households spend their income (apart from savings) on consumption of final goods and services for the satisfaction of their basic wants. Consumption may thus be defined as the expenditure by households on final goods and services. The main elements of household consumption are expenditures on food, housing, clothing, transportation, medical care, etc.

Does consumption depend upon income? Yes, consumption is a part of income and directly depends upon income itself. However, we must note that consumption is necessary for survival and thus takes place even if income is zero. In such a case, households might be consuming from sources such as accumulated wealth, borrowing, or begging (seeking charity). In this context, there are two categories of consumption:

- Consumption when income is zero – i.e., when a minimum level of consumption must be maintained for survival. This is called autonomous consumption, and it is independent of income level.
- Consumption when income rises – With an increase in income, consumption also increases, but usually less than the income increased. This part of consumption, which varies with income, is called induced consumption.

Table 8.1 shows the relationship between increasing income and increasing consumption.

Table 8.1: Relationship between income and consumption

Income (in units of money)	Consumption expenditure (in units of money)
0	100
200	200
400	300
600	400
800	500
1000	600

As shown in the schedule in Table 8.1, there is always a minimum level of consumption expenditure, even if income is zero. This is why, at zero income level, consumption expenditure is represented by a positive value 100 units of money) rather than zero units. The table also shows that, with increases in income, consumption expenditure also increases but at lesser rate.

Table 8.1 also clearly shows that the relationship between income and consumption expenditure is always positive or direct.

Determinants of Consumption Expenditure

The previous section discussed consumption expenditure at the individual (household) level. Adding together individual consumption expenditures gives us national consumption expenditure. As discussed earlier, consumption expenditure as a macroeconomic variable (national consumption expenditure) is crucial to any economy's performance.

The major determinants of consumption expenditure at individual and national levels are:

- Money Income: The relationship between money income and consumption expenditure is positive and direct. The increase in income results in an increase of consumption expenditure. This principle also acts inversely.
- Distribution of Income: Consumption expenditure per unit of income is more for poor people than rich people. Unequal distribution of a nation's income reduces consumption expenditure, and equality in distribution of income increases it.
- Level of Direct Taxes: A higher level of direct taxes leads to a lower level of personal disposable income, and thus to a decrease in consumption expenditure. This principle also acts inversely.
- Expectation of the Future: If prices are expected to rise in the future, present consumption will be more. This principle also acts inversely.
- Rate of Interest: Increases in the rate of interest lead to a reduction of consumption expenditure and an increase in saving. This principle also acts inversely.
- Level of Wealth: A higher wealth level leads to higher consumption expenditure. This principle also acts inversely.

Consumption Function

Consumption function is one of the most important tools in macroeconomics. It shows the relationship between level of consumption and level of income. The consumption function is also known as propensity to consume.

The consumption function indicates how consumption responds to different levels of income. The functional relationship between consumption and income is generally expressed as:

$$C = f(Y_d) \qquad (8.1)$$

Where C = consumption expenditure, and

Y_d = personal disposable income.

$C = a + bY_d$, where a is autonomous consumption, b is percentage of income for consumption, and bY_d is induced consumption.

Example: Consider a consumer with a consumption function given by $C = 110 + 0.75Y_d$, and disposable income of Birr 4,800. Calculate the consumer's:

a autonomous consumption
b induced consumption
c total consumption
d saving

Solution: Given: Consumption function $C = 110 + 0.75Y_d$
Disposable income = 4,800

a Autonomous consumption is the level of consumption when income is zero. Thus,

Autonomous consumption = $110 + 0.75 \times 0 = 110$

b Induced consumption is = Total consumption – Autonomous consumption

Induced consumption = $0.75 \times 4,800 = 3,600$

c Total consumption = Autonomous consumption + Induced consumption

$= 110 + 3,600 = 3,710$

d Saving = $Y_d - C = 4,800 - 3,600 = 1,200$

$S = Y_d - bY_d$

Note that propensity to consume does not mean desire to consume. It means the actual consumption that takes place, or is expected to take place, out of varying levels of income. A distinction may be made here between consumption and consumption function. Consumption refers to the amount of income which is spent upon the purchase of goods and services at a given level of income, but consumption function refers to the whole of a schedule that shows consumption expenditure at various levels of income.

Propensity to consume or consumption function demonstrates the fact that, as income increases, consumption also increases but by less than the increase in income. An important fact about the behavior of the consumption function is that it is stable in the short run. Further, even when income is zero, consumption is always positive (i.e., there is always some minimum level of consumption even when income is zero). The following hypothetical schedule and corresponding graph illustrate the concept of consumption function:

© MoE FDR Ethiopia Not to be resold Published

Table 8.2: Hypothetical Consumption Function Schedule

Level of National Income (in million Birr) (Y_d)	Consumption (in million Birr) (C)
0	50
50	75
100	100
150	125
200	150
250	175
300	200

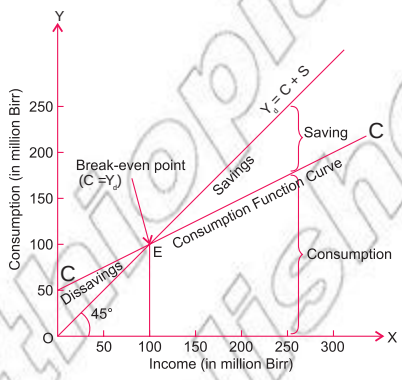


Figure 8.1: Consumption function curve

Consider the preceding Table 8.2 and Figure 8.1 for the hypothetical situation, and note the following facts:

- Consumption increases with increase in income. When income level is zero, the minimum level of consumption is Birr 50 million in our hypothetical situation. When income is Birr 100 million, consumption is also Birr 100 million. When income exceeds Birr 100 million, consumption also increases, but it lags behind the increase in income.
- Consumption (i.e., autonomous consumption) can never be zero, even if income is zero, because a minimum level of consumption must be maintained for survival. That is why the consumption function curve starts from point C and not from zero. In such a situation, the economy draws on past savings in the absence of current income. In the figure, OC is the minimum level of consumption.
- The 45° line Y_d = C + S is called the expenditure equals income line. Its significance is that each point on this line shows expenditure equal to income. Comparing the consumption function curve with the 45° line for any point tells us whether consumption is equal to, greater than or less than income level.

The point at which the consumption function curve intersects the 45° line is known as the break-even point. It indicates equality between consumption and income. Above the 45° line consumption spending is more than income (indicating dissaving), whereas below this line consumption expenditure is less than income (indicating positive saving).

Note:

The amount of dissaving or positive saving is measured by the vertical distance between the consumption curve and the 45° line.

- Line CC represents the consumption function curve, which is also simply called the consumption curve.

The relationships between consumption and income (propensity to consume) are expressed in the following ways. The next sections describe their numerical expressions.

i Average Propensity to Consume (APC)

ii Marginal Propensity to Consume (MPC)

I Average Propensity to Consume (APC)

APC is the ratio of total consumption expenditure (C) to total income (Y_d) at a given level of income in an economy. Symbolically,

$$APC = \frac{C}{Y_d} \qquad (8.2)$$

For example, if at a particular time, the income level in an economy is Birr 250 million, and consumption is Birr 175 million,

$$APC = \frac{C}{Y_d} = \frac{175}{250} = 0.7 \text{ or } 70\%$$

This example indicates that 70% of income was spent by way of consumption expenditure. But if aggregate income is very low — for example, Birr 50 million – and if aggregate consumption is Birr 75 million, APC = 75/50 = 1.5.

Thus the value of APC may be greater than 1, because when income is at a very low level, consumption exceeds income to meet the very basic necessities. (Then saving becomes negative).

Table 8.3 demonstrates the estimation of APC, using a hypothetical situation.

Table 8.3: Hypothetical estimation of APC

Income (in million Birr) (Y_d)	Consumption (in million Birr) (C)	APC $\frac{C}{Y_d}$
200	150	0.75
250	175	0.7
300	200	0.66

Observe that APC continues to decline as long as income increases

© MoE FDR Ethiopia Not to be republished

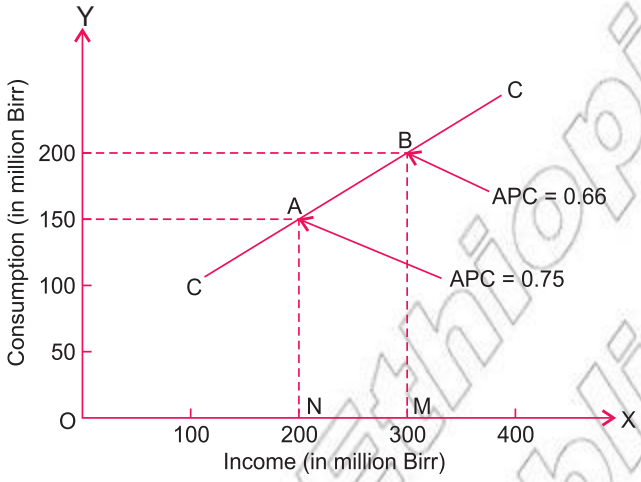


Figure 8.2: Estimation of APC

In Figure 8.2, CC is the consumption curve. It shows that, at point A,

$$APC = \frac{C}{Y_d} = \frac{AN}{ON} = \frac{150}{200} = 0.75$$, and that, at point B,

$$APC = \frac{BM}{OM} = \frac{200}{300} = 0.66$$

Thus, as income increases, APC falls.

II Marginal Propensity to Consume (MPC)

The ratio of change in consumption (C) to change in income (Y_d) is called marginal propensity to consume. Literally, marginal means additional (or incremental) and propensity to consume means desire (or urge) to consume. Thus MPC is the ratio of additional consumption expenditure to additional income. It indicates the proportion of the additional income that is spent on additional consumption. Symbolically,

$$MPC = \frac{C}{Y_d} \qquad (8.3)$$

For example if a country's national income increases from Birr 200 million to Birr 250 million, and as a result consumption expenditure goes up from Birr 150 million to Birr 175 million, then

$$MPC = \frac{C}{Y_d} = \frac{25}{50} = 0.50$$

Note that, with an increase in income, consumption expenditure also increases

© MoE FDR Ethiopia Not to be republished

(i.e., MPC > 0), but the entire increase in income is not spent on consumption (i.e., MPC < 1).

The following table demonstrates MPC estimations, using a hypothetical situation.

Table 8.4: Hypothetical MPC estimation

Income (in million Birr) (Y_d)	Change in Income (ΔY_d)	Consumption (in million birr) (C)	Change in Consumption (ΔC)	MPC $\frac{\Delta C}{\Delta Y_d}$
150	—	100	—	—
250	100	150	50	0.5
350	100	175	25	0.25

Table 8.4 shows that, with increase in income, consumption also increases but by less than the increase in income. In the hypothetical situation, when income increased from Birr 150 million to 250 million, consumption increased from Birr 100 million to Birr 150 million. Therefore,

$$\frac{\Delta C}{\Delta Y_d} = \frac{50}{100} = 0.5$$

This indicates that people spent 50% of the increased income. Also observe that MPC goes on declining with increases in income.

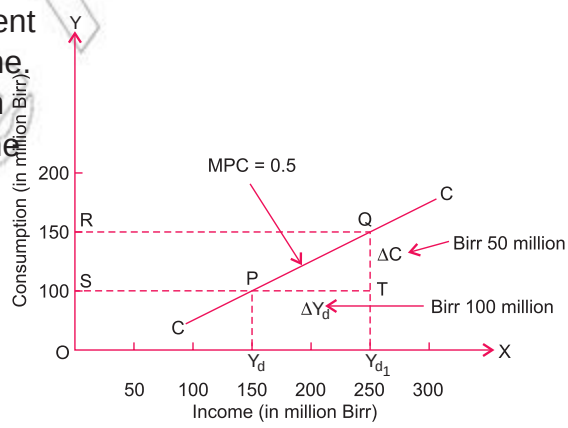


Figure 8.3: Estimation of MPC

Figure 8.3 shows OY_d as original income = Birr 150 million. It goes up to OY_{d_1}. Thus change in income is $Y_dY_{d_1}$ = Birr 100 million. With this change, consumption level changes from Birr 100 million to Birr 150 million — i.e., by QT = Birr 50 million. At point Q,

$$\frac{\Delta C}{\Delta Y_d} = \frac{50}{100} = 0.5$$

Properties of MPC

The following are the main properties of MPC.

- MPC is greater than zero but less than one This is because, with an increase in income, consumption expenditure also increases. But the entire increase in income is not spent part of it is saved. Thus, MPC > 0, but MPC < 1.
- MPC falls with increase in income As the community becomes richer, it tends to consume a smaller percentage of each increment to its aggregate income.
- MPC of the poor class is higher than those of other classes: In the case of poor people, most of their basic needs remain unfulfilled. As a result, an additional increment to income leads to greater consumption.
- MPC is stable in the short run: This is because it depends upon psychological factors which do not change in the short run.

Activity 8.1

1 Suppose a given family has an income of Birr 10,000 and saves only Birr 500. What is its average propensity to consume? Can you tell from this information about the MPC of the family?

2 Assume for the above example that the income of the family rises to Birr 12,000 and, as a result, the family increases the amount that it saves to Birr 700. What is the marginal propensity to consume?

3 Suppose that a given family spends Birr 2,000 at zero income and then, as its income increases, it spends 80 per cent of it on consumption over and above the Birr 2,000What is the family's total consumption spending when its income is Birr 20,000?

4 Answer the following:

a Can the value of APC be greater than one? Give reasons for your answer.

b Can the value of MPC be greater than one? Give reasons for your answer.

c Copy and complete the following tabulation. Its values are in million Birr.

National Income (Y)	Consumption (C)	APC	MPC
0	30	-------	-------
100	100	-------	-------
200	170	-------	-------
300	240	-------	-------
400	310	-------	-------
500	380	-------	-------
600	450	-------	-------

5 In your economics workgroup, discuss the relationship between income and consumption.

6 In your economics workgroup, discuss and answer this question: How does MPC affect the level of national income?

8.2 SAVING

At the end of this section, you will be able to:

- explain what saving is; and
- identify the determinant of saving.

Key Terms and Concepts

- Average Propensity to save (APS)

Start-up Activity

Comment on the saving habits of your family members.

The part of income which is not spent on consumption is called saving. This is because income is either consumed or saved. Thus, we may say 'Savings is an excess of income over consumption expenditure'. By deducting consumption expenditure (C) from income (Y_d), we get savings (S). Symbolically:

$$S = Y_d - C \qquad (8.4)$$

Note the following points in the context of saving:

- Just like consumption, saving depends directly upon income.
- As income increases, savings also increase, but the rate of increase in savings is more than the rate of increase in income. This means that as income increases, the proportion of income saved increases (and the proportion of income consumed decreases).
- At low income levels, savings is negative. In other words, when there is no income or a very low level of income, consumption expenditure is more than income, leading to negative saving (i.e., dissaving).

Determinants of Saving

The major determinants of saving at the individual and national levels are:

- Level of Income: As stated above, as income increases, saving also increases. But the rate of increase in saving is higher than the rate

of increase in income. This is because, with an increase in income, consumption increases but by less than the increase in income.

- Distribution of Income: Saving increases when income inequality increases. This is because the tendency to save is greater for rich people than poor people.
- Expectation Future for the: If prices are expected to fall in the future, present consumption is less, and hence saving is more. This principle also acts inversely. Similarly, an expected future increase in income, reduces present saving, and the inverse.
- Rate of Interest: A higher rate of interest induces greater saving. This principle also acts inversely.
- Level of Wealth: A lower wealth level leads to a lower saving level. This principle also acts inversely.
- Level of Direct Taxes: A higher level of direct taxes produces a lower level of personal disposable income and hence reduced savings. This principle also acts inversely.
- Individual Nature: Saving is directly related to the nature of the individual. For example, a miser saves more than a spendthrift.

Saving Function

The functional relationship between saving and income is called saving function (or propensity to save). The saving function is the proportion of income which is saved. Thus saving (S) is a function (f) of income (Y_d). Symbolically:

$$S = f(Y_d) \text{ or } S = Y_d - C \qquad (8.5)$$

The saving function shows the tendency of households to save at given levels of income. Thus the saving function is a corollary or reciprocal of the consumption function.

The following hypothetical schedule and corresponding graph illustrate the concept of the saving function.

© NCERT Not to be republished

Table 8.5: Hypothetical Saving Function Schedule (in million Birr)

Income (Y_d)	Consumption (C)	Savings (S)
0	50	–50
50	75	–25
100	100	0
150	125	25
200	150	50
250	175	75
300	200	100

Table 8.6 shows that saving (S) tends to increase with income (Y_d). When income is zero, saving is negative because consumption exceeds income. When income in our hypothetical schedule increases beyond Birr 100 million, saving increases faster than income. Figure 8.4 also shows that saving is negative until income reaches Birr 100 million. After Birr 100 million, saving increases with every increase in income.

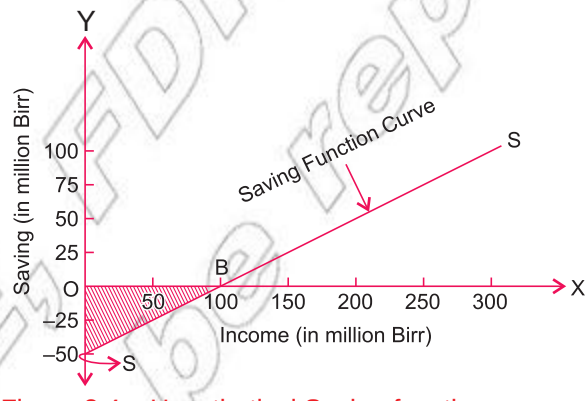


Figure 8.4: Hypothetical Saving function curve

Point B in Figure 8.4 represents the break-even point, because at this point savings are zero — i.e., consumption is equal to income. The shaded area reflects dissavings, which are equal to autonomous consumption.

Consumption and Saving Functions are Complementary

Since income is either consumed or saved, consumption + saving is always equal to income. This indicates that the consumption and saving curves, which represent the consumption and saving functions, are complementary. Thus, if we know an income, we can derive the saving function directly from the consumption function, as shown in Figure 8.5. Part A of the figure shows the consumption

© MoE-FDRE Ethiopia Not to be republished

function, and Part B shows the saving function. Observe from the figure that the saving function is the mirror image of the consumption function.

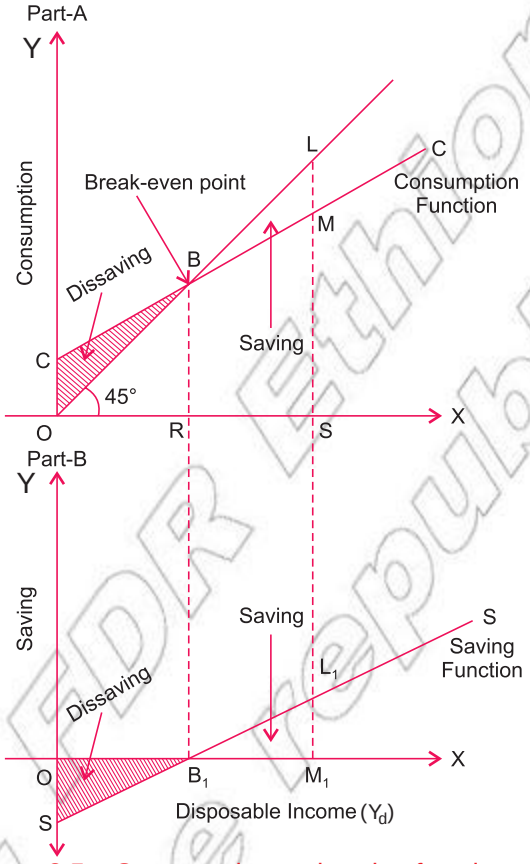


Figure 8.5: Consumption and saving functions

As in the case of the consumption function, the relationships between saving and income (propensity to save) are expressed in the following ways. The next sections present their numerical expressions.

i Average Propensity to Save (APS)

ii Marginal Propensity to Save (MPS)

I Average Propensity to Save (APS)

Average propensity to save is the ratio of total savings (S) to total income (Y) is the part of total income which is saved. Symbolically:

$$APS = \frac{S}{Y_d} \qquad (8.6)$$

For example, if income (Y_d) is Birr 250 million and saving(s) is Birr 75 million,

© MoE FDR Ethiopia Not to be republished

$$APS = \frac{S}{Y_d} = \frac{75}{250} = 0.3 \text{ or } 30\% = 0.3 \text{ or } 30\%$$

Table 8.7 demonstrates APS estimations, using a hypothetical situation.

Table 8.6: Hypothetical APS estimation

Income (in million Birr) (Y_d)	Saving (in million Birr) (S)	APS $\frac{S}{Y_d}$
200	50	0.25
250	75	0.3
300	100	0.33

Observe that APS continues to increase as long as income increases

In Figure 8.6, SS is the saving curve. It shows that, at point A,

$$APS = \frac{S}{Y_d} = \frac{50}{200} = 0.25$$

and that, at point B,

$$APS = \frac{100}{300} = 0.33$$

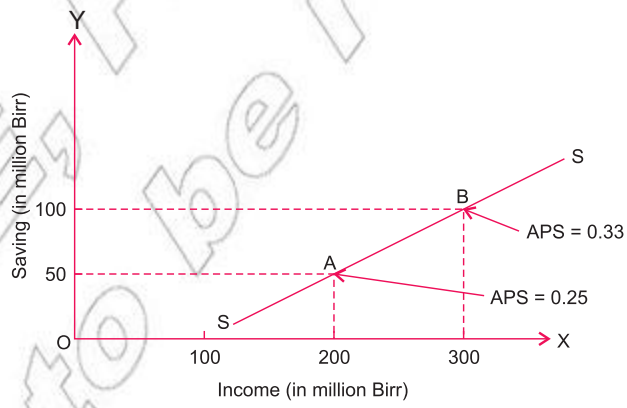


Figure 8.6: Estimation of APS

II Marginal Propensity to Save (MPS)

It is the ratio of the change in saving (ΔS) to the change in income (ΔY_d). Symbolically:

$$MPS = \frac{S}{Y_d} \qquad (8.7)$$

For example, if a country's national income increases from Birr 200 million to Birr 250 million, and saving increases from Birr 50 million to Birr 75 million, then

$$MPS = \frac{S}{Y_d} = \frac{25}{50} = 0.50$$

Table 8.7 shows MPS estimation using a hypothetical situation.

Table 8.7: Hypothetical MPS estimation

Income (in million Birr) (Y_d)	ΔY_d	Saving (in million Birr) (S)	ΔS	MPS $\frac{\Delta S}{\Delta Y_d}$
150	–	50	–	–
250	100	100	50	0.50
350	100	175	75	0.75

Table 8.7 shows that, when income increases, saving also increases. When income increases in the hypothetical situation from Birr 150 million to Birr 250 million, saving increases from Birr 50 million to Birr 100 million. Therefore,

$$MPS = \frac{S}{Y_d} \quad \frac{50}{100} \quad 0.50$$

This indicates that people saved 50% of the increased income.

Observe that MPS continues to increase as long as income increases

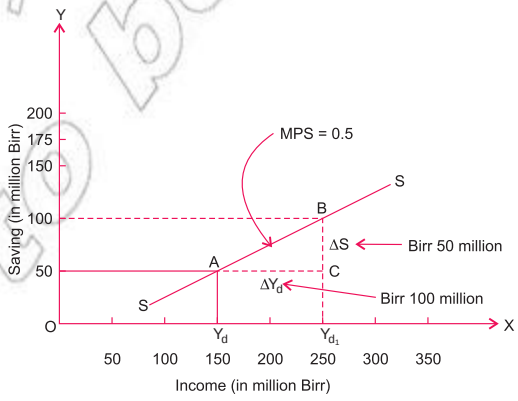


Figure 8.7: Hypothetical Estimation of MPS

In Figure 8.7, when income is OY_d = 150, saving is AY_d = 50. When income increases to OY_{d_1} = 250, saving increases to BY_{d_1} 7 K X ¥ 100 and û 6 7 K H U H I R U H 0 3 6 D W S R L Q W %

—— = —— = —— =

Properties of MPS

The main properties of MPS are:

- Value of MPS lies between 0 and 1. In other words, 0 < MPS < 1.
- MPS increases with increase in income.
- The MPS of the poor is lower than that of the rich.

8.3 RELATIONSHIP BETWEEN CONSUMPTION AND SAVING

At the end of this section, you will be able to:

- show the relationship between consumption and saving.

Key Terms and Concepts

- Saving function
- Rate of interest

Start-up Activity

What is your personal opinion of this statement? "Many Ethiopian families do not know how to balance their consumption and saving levels for their households."?

As you already know, the consumption function and the saving function are interrelated and counterparts of each other. Consumption and saving both depend on income, and their sum total is equal to total income i.e., $C + S = Y_d$. From this, it also follows that the concepts of APC and MPC are respectively related to the concepts of APS and MPS.

Relationship between APC and APS

We know $Y_d = C + S$, dividing both sides by Y_d, we get

$$\frac{Y_d}{Y_d} = \frac{C}{Y_d} + \frac{S}{Y_d}$$

$$1 = APC + APS$$

or APC = 1 – APS, and APS = 1 – APC (8.8)

We may conclude the sum of APC and APS is always equal to unity (1). This is because income is either consumed or saved.

Note that the value of APS is negative when consumption expenditure is greater than income.

Relationship between MPC and MPS

We know $Y_d = C + S$

$\Delta Y_d = \Delta C + \Delta S$

Dividing both sides by ΔY_d, we get

$$\frac{Y_d}{Y_d} = \frac{C}{Y_d} + \frac{S}{Y_d}$$

$$1 = \frac{C}{Y_d} + \frac{S}{Y_d}$$

$$1 = MPC + MPS$$

or MPC= 1 – MPS, ad MPS = 1 – MPC (8.9)

We may conclude the sum of MPC and MPS is always equal to unity (1). The following list shows this inter-relationship:

- APC + APS = 1
- APS = 1 – APC
- APC = 1 – APS
- MPC + MPS = 1
- MPS = 1 – MPC
- MPC = 1 – MPS

Activity 8.2

1 Can the value of APS be negative? If so, when? Give an example in support of your answer.
2 What is the maximum possible value of MPS?
3 What is the value of MPC when MPS = 0?

4 Calculate MPS from the following data:

Income (Birr)	Consumption expenditure (Birr)
1000	1500
2000	2000

5 If disposable income is Birr 1000, and consumption expenditure is Birr 700, what is the average propensity to save? Can you use this information to calculate the marginal propensity to save?

6 Calculate MPS from the following data:

Income (Birr)	Saving (Birr)
100	60
200	100

7 In your economics work group, discuss the relationship between income and saving. Create a diagram that interprets the result of your discussion.

8.4 INVESTMENT

At the end of this section, you will be able to:

- define investment;
- state the determinants of investment; and
- appreciate about the i mpact of investment on economic growth.

Key Terms and Concepts

- Autonomous investment
- Induced investment

Start-up Activity

What type of investment activities are occurring in your locality? Comment the overall activities of such investments.

Meaning of Investment

In economics, the meaning of investment is quite different from its common use by an ordinary person who speaks of 'investing' when he or she purchases a piece of land, an old house, securities, debentures, etc. In economic analysis, these transactions are simply the transfer of ownership rights from one person to the other and, as such, result in no increase in income and employment. In economics, investment means an addition, during a predefined 'current period',

to national resources such as:

- existing stock of physical (or real) assets for example, the building of new factories, new machines or equipment;
- existing stock of finished goods or raw materials.

Investment can be induced as well as autonomous.

Induced Investment

Induced investment is investment which is made with the motive of earning a profit as in the private sector. Induced investment depends directly upon profit expectations. It is income-elastic. If national income goes up, induced investment also goes up – an increase in income induces investment. This occurs because an increase in national income leads to an increase in the demand for goods and services, which increases investor interest in meeting that demand, and therefore leads to investment. Thus, we can say that induced investment takes place when levels of income and demand in the economy go up. That is why the induced investment curve, like the supply curve, is positively sloped, as shown in Figure 8.8.

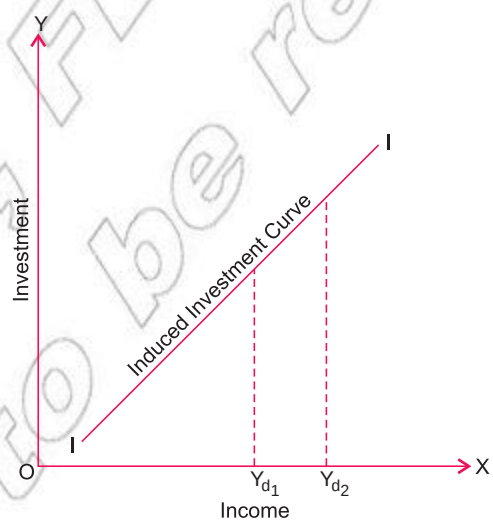


Figure 8.8: Induced investment

Autonomous Investment

Autonomous investment refers to investment which is made irrespective of income level. This approach is generally taken in the government sector. Autonomous investment is income inelastic – it is not affected by changes in income level.

© MoE: FDRE Ethiopia Not to be republished

The volume of autonomous investment is the same at all levels of income. That is why the autonomous investment curve is a straight line, parallel to the X-axis, as shown in Figure 8.9. Autonomous investment is generally affected by autonomous factors (other than income) such as public utility works, construction of railways and roads, changes in the nature of consumer demand, increase in population, discovery of new resources, new technology, etc. For instance, government investment in public utilities like the construction of railways, roads, post and telegraph, electricity, etc., is normally autonomous investment.

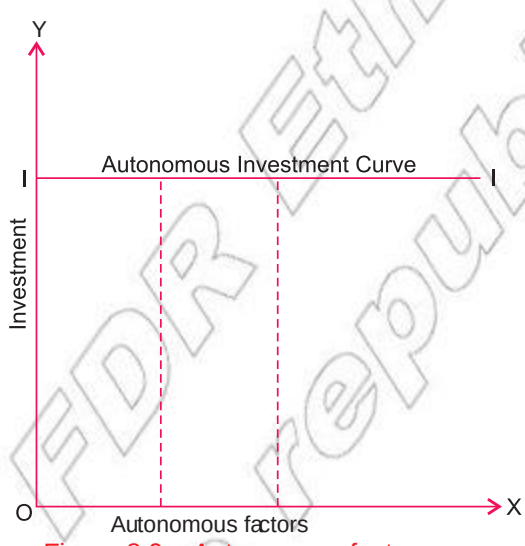


Figure 8.9: Autonomous factors

Remark: Any investment made for the purpose of compensating for depreciation caused by production in a current year is not real investment. Rather, it is what is sometimes known as replacement investment

Determinants of Investment

The basic motive for any private sector entrepreneur to invest is to earn profits (which, as you know, is the excess of revenue over production cost). Thus expectation of profit is the main determinant of the level of investment in an economy. Here is more information about this factor and about related factors and determinants of investment.

- Profit Expectation: Business investment depends upon the expectations of the business firms involved. If the business people feel confident that opportunities for making profits in the future exist, they will be prepared

to undertake investment expenditure. On the other hand, if they do not expect to make profits, they will not invest.

- Rate of Interest: After business expectation of profit opportunities is taken into account, investment depends upon the rate of interest, on the one hand, and upon the expected rate of return on capital. This expected rate of return is called marginal efficiency of capital or marginal efficiency of investment.
- If investment is to be profitable, then the expected rate of profit cannot be less than the current rate of interest in the market. For instance, if an entrepreneur finds out that funds for a project must be borrowed at a 15% interest rate, then the proposed investment would be undertaken only if the project's expected rate of profit were more than 15%. We thus see that investment depends upon the marginal efficiency of investment, on the one hand, and upon the rate of interest, on the other.

- Corporate Tax:Taxes are imposed by governments on corporations. A corporation uses part of its revenues to pay these taxes. The higher the tax rate is, the more that paying taxes reduces revenues and, in turn, reduces profits. Therefore, we can say that a decrease in the rate of corporate tax induces investment. This principle also acts inversely.
- Level of National Income: If national income goes up, induced investment also goes up. The reason is that an increase in national income leads to an increase in the demand for goods and services and in investors' interest in supplying them, which leads to increased investment. Therefore, we can say that a higher level of national output induces investment. This principle also acts inversely.

Role of Investment in Economic Growth

Economic growth refers to an increase in the total output of a nation over time. Investment plays a crucial role in the economic growth of a nation. Nations that invest a large part of their income tend to have rapid output growth. As you know, investment in an economy can be in the private sector and in the public (government) sector. The roles of these two types of investment in economic growth are discussed below.

Role of Private Investment in Economic Growth

Investment made by the private sector in the form of new machinery and equipment, the building of new factories, increases in inventories, etc., increases the productive capacity of the economy and hence increases output and income. Note that, whenever investment is increased in a country, income and output increase many times more than the increase in investment. Therefore, we can say that an increase in the level of investment brings rapid economic growth to a country.

Role of Public Investment in Economic Growth

Public investment plays an active role in promoting economic growth, especially in developing countries.

- Public investment promotes economic growth directly by developing social overhead and infrastructure, by establishing capital-good industries, basic and key industries, etc.
- Public investment can stimulate economic growth indirectly by providing education, training, and research facilities. Public investment in education and training and in public health and social security schemes increases peoples' efficiency and skills, and thereby contributes to economic growth.
- Public investment reduces disparities in income and wealth as well as regional disparities. Thus public investment promotes the achievement of economic growth with social justice.

Activity 8.3

In your economics work group, discuss and answer this question: How does induced investment depend upon the market rate of interest? Create a graphic presentation of the results of your discussion.

Practical Work

1 Answer each of these questions and then consider the solutions.

a If APS is 0.6, how much is APC?

Solution: APC = 1 – APS = 1 – 0.6 = 0.4

b If APC is 0.7, how much is APS?

Solution: APC + APS = 1, therefore APS = 1 – 0.7 = 0.3

c If MPC is 0.75, what is MPS?

Solution: MPS = 1 – MPC = 1 – 0.75 = 0.25

d If APC is 0.75, how much is APS?

Solution: APS = 1 – APC = 1 – 0.75 = 0.25

e If MPS = 1, how much is MPC?

Solution: MPC = 1 – MPS = 1 – 1 = 0

f From the following income consumption schedule, calculate:

i saving

ii average propensity to consume

iii marginal propensity to consume

Income	0	100	200	300	400
Consumption	60	110	150	180	200

Solution:

Income (Y_d)	Consumption (C)	Saving (S) (Y_d C)	APC $\frac{C}{Y_d}$	MPC $\frac{'C}{'Y_d}$
0	60	–60	’	—
100	110	–10	1.10	0.50
200	150	50	0.75	0.40
300	180	120	0.60	0.30
400	200	200	0.50	0.20

2 From the following information, find out:

i average propensity to save

ii marginal propensity to save

Income	100	200	300
Saving	20	80	150

© MoE-ELRC Ethiopia Not to be republished

Solution:

Income (Y_d)	Savings (S)	APS $\frac{S}{Y_d}$	MPS $\frac{\Delta S}{\Delta Y_d}$
100	20	0.20	—
200	80	0.40	0.60
300	150	0.50	0.70

3 If disposable income is Birr 1,000 and consumption expenditure is Birr 750, what is APS?

Solution:

$$APS = \frac{S}{Y_d} = \frac{250\ (1{,}000\ \ 750)}{1{,}000} = \frac{1}{4} = 0.25 \text{ or } 25\%$$

© MoE, FDR Ethiopia Not to be republished

UNIT SUMMARY

- Consumption refers to the amount of income which is spent by households to purchase final goods and services.
  - Autonomous consumption is consumption when income is zero.
  - Induced consumption is consumption which varies with income. Determinants of induced consumption are:
    - Money income
    - Distribution of income
    - Level of direct taxes
    - Expectations of the future price
    - Rate of interest
    - Level of wealth
- Consumption function shows the relationship between consumption level and income level $C = f(Y_d)$ $C = a + b Y_d$
- The break-even point is the point in income level at which consumption expenditure is exactly equal to income and there is no saving.
- Average propensity to consume (APC) is the ratio between total consumption and total income.

$$APC = \frac{C}{Y_d}$$

- Marginal propensity to consume (MPC) is the ratio of change in consumption to change in income.

$$MPC = \frac{C}{Y_d}$$

- Savings is that part of income which is not spent on consumption $S = Y_d - C$. Determinants of savings are:
  - Level of income
  - Distribution of income
  - Future expectations of price
  - Rate of interest
  - Level of wealth
  - Level of direct taxes
  - Individual nature
- The saving function shows the relationship between saving level and income level S = f(Y). Consumption and saving functions are complementary.
- Average propensity to save (APS) is the ratio between total saving and total income.

$$APS = \frac{S}{Y_d}$$

- Marginal propensity to save (MPS) is the ratio between change in saving and change in income.

$$MPS = \frac{S}{Y_d}$$

- MPS value lies between 0 and 1. APC + APS = 1. MPC + MPS = 1.
- Investment means the expenditure by people or business firms on the purchase or production of new capital goods such as machinery, factories, tools, houses, etc., which leads to the addition to the stock of capital in the economy. Investment also includes additions to the inventories of consumer goods and raw materials.
- Induced investment is investment made with the motive of earning profits.
- Autonomous investment is investment which is made irrespective of income level.
- Determinants of investment are:
  - Profit expectations
  - Rate of interest
  - Corporate tax
  - Level of national income.

REVIEW EXERCISE FOR UNIT 8

I Write detailed answers to the following.

1 Explain the concept of consumption function, using an example and a diagram.

2 Explain the concept of saving function, using an example and a diagram.

3 Explain the concepts of consumption function and saving function, using examples and diagrams.

4 Explain the relationship between marginal propensity to consume and marginal propensity to save.

5 Explain the relationship between average propensity to consume and average propensity to save.

6 Describe briefly the major factors that affect consumption expenditure.

7 Describe briefly the determinants of saving.

8 Consumption function and saving function are complementary to each other. Explain this fact, using a diagram.

9 Create a schedule and curve to explain propensity to save.

10 Explain clearly the concept of investment as used in macroeconomics.

11 What do you mean by private investment and public investment?

12 Explain the concept of induced investment and autonomous investment.

13 "Autonomous investment is income-inelastic". Explain this statement, using an example.

14 Describe the main determinants of investment.

15 Explain the role of investment in economic growth.

II Distinguish between the following:

16 Private investment and public investment

17 Induced investment and autonomous investment

18 Average propensity to consume and marginal propensity to consume

19 Average propensity to save and marginal propensity to save

20 Marginal propensity to consume and marginal propensity to save

III For each of the following statements, indicate whether it is 'True' or 'False'.

21 The relationship between disposable income and consumption is known as propensity to consume.

22 Investment is the part of income which is used for the creation of new capital assets.

23 Demand for investment continues increasing as rate of interest increases.

24 At the break-even point, consumption is more than income.

25 The value of APC can be greater than 1.

26 MPC increases with increase in income.

27 As income increases, saving also increases.

28 The tendency to save is less for rich people than for poor people.

29 A lower level of wealth leads to a lower level of saving.

30 A higher level of direct taxes leads to increased saving.

IV For each of the following, four choices are given, but only one out of them is correct. Choose the correct one.

31 At the break-even point:

A disposable income is equal to consumption

B income is less than consumption

C income is more than consumption

D none of the above.

32 Important considerations for making investments are:

A safety of funds

B rate of interest

C return on investment

D all of the above

33 The consumption function is a relationship between:

A level of consumption and investment

B level of income and consumption

C level of income and saving

D level of consumption and saving

34 The saving function is a relationship between:

A level of saving and investment

B level of saving and consumption

C level of saving and income

D none of the above

35 Autonomous investment is:

A income-inelastic

B income-elastic

C dependent upon rate of interest

D dependent upon rate of corporate tax

V Match the following:

Column A	Column B
36 APC	A $\frac{S}{Y_d}$
37 APS	B $\frac{S}{Y_d}$
38 MPC	C $\frac{C}{Y_d}$
39 MPS	D $\frac{C}{Y_d}$

VI Write very short answers to the following.

40 Can consumption be greater than income?

41 What type of relationship is found between consumption and income?

42 What is the relationship between MPC and MPS?

43 What is the relationship between APC and APS?

44 What is the value of MPS when MPC = 0?

45 How much is MPS in an economy in which MPC = 0.6?

46 How much is MPC in an economy in which MPS = 0.2?

47 If APC = 0.65, how much is APS?

48 If APS = 0.26, how much is APC?

49 If disposable income is Birr 1200, and consumption expenditure is Birr 800, what is APS?

50 If disposable income is Birr 2000, and saving is Birr 500, what is APC?

51 Mention two factors that determine the level of investment in an economy.

52 Mention two factors that determine the level of saving in an economy.

53 Consumption at zero level of income is known by what name?

54 What is the impact of an increase in the rate of corporate tax on the level of investment in an economy?

55 If the consumption function of a given individual is given as $C = 44 + 0.86Y_d$, and the individual's disposable income for a specific period was Birr 3600, then calculate the:

- a autonomous consumption
- b induced consumption
- c total consumption
- d saving
- e APC and APS

9

Unit Objectives

After completing this unit, you will be able to:

- realize the concept of balance of payments and identify the parts of balance of payments;
- understand the restriction on trade and modes of payments; and
- exemplify the impact of foreign trade on the economy.

Main Contents

9.1 INTERNATIONAL TRADE

9.2 BALANCE OF PAYMENTS

9.3 FOREIGN EXCHANGE RATES

- Unit Summary
- Review Exercise

© Mo... Not to ...

INTRODUCTION

Just as an individual produces only that commodity which he/she can produce with the greatest skill and efficiency, similarly a nation produces only those commodities which it can produce with great efficiency and minimum cost. On the other hand, just as an individual cannot produce all commodities he/she wishes to consume, similarly, a nation cannot produce all of the commodities which its nationals wish to consume. Each country has to depend on others for the supply of commodities which it cannot produce. This gives rise to international trade, i.e., the exchange of goods and services among different countries. Naturally, this exchange of goods and services involves payments by one country to another. A concept broadly related to such payments is known as *balance of payments*. In the present unit we discuss some important aspects of international trade and balance of payments — features, causes, benefits, procedures, etc.

9.1 INTERNATIONAL TRADE

At the end of this section, you will be able to:

- define the concept of international trade;
- analyze absolute advantage and comparative advantage;
- explain import and export;
- distinguish the difference between trade surplus deficit and balance;
- identify and define the basic restrictions on trade; and
- identify and explain mode of payment in international trade.

Key Terms and Concepts

- Import
- Export
- Trade surplus
- International trade
- Absolute advantage
- Comparative advantage
- Volume of trade
- Value of trade
- Tariff restrictions
- Import quota

Startup Activity

What do you mean by international trade? Discuss its advantages, with examples.

No country in the world is completely self-sufficient, i.e., no country produces all the goods and services that it requires. Due to differences in the availability of natural resources and other inputs required for production, some countries specialise in production of some goods which they produce more cheaply than other countries. The other countries may likewise produce some other goods relatively cheaply. Hence, countries specialise in the production of those goods for which they are best suited. They produce more of such goods than their own requirements and exchange their surplus production for those goods from other countries that they need but either cannot produce at all or can produce only at a relatively high cost. This sort of international specialisation gives rise to the exchange of goods (purchase and sale) across geographical boundaries of countries. This is called international trade or foreign trade. We may say international trade refers to the exchange of goods and services among different countries of the world.

The above paragraph makes it clear that nations trade with each other because of their specialisation in the production of certain goods. But what are the factors that determine this specialisation?

Factors Determining International Trade

Some of the factors which are responsible for international specialisation, and hence international trade, are identified as follows:

- **Unequal Distribution of Natural Resources:** Natural resources are not equally distributed over the world. These resources are in the form of agricultural land, mineral deposits, forests, seas, rivers, climatic conditions, etc. For example, Ethiopia is rich in natural resources. On the other hand Japan is deficient in natural resources. A land-abundant country may specialise in the production of agricultural products, minerals, timber, fish, etc.
- **Unequal Distribution of Population:** Population is the source of labour supply. Labour-scarce countries prefer to import labour-intensive products from labour-abundant countries.
- **Unequal Distribution of Capital:** Capital is probably the most important factor of production in the sense that, in the absence of capital, all other resources may remain inactive. Capital means man-made machines,

equipment, etc. A country that is rich in capital exports capital-intensive goods. Japan, the USA, Germany, the UK, France, etc., are capital-rich countries and thus export machines and equipment.

- Level of Technological Development: Technology is another important aspect of production. Countries using sophisticated technology specialize in technology-based goods like computers, telecommunication equipment, airplanes, etc. Those countries that do not have advanced technology have no option but to import technology-based goods from technology-rich countries.
- Increasing Returns to Scale: The countries which are in a position to produce goods on large scales enjoy significant reductions in per-unit costs as they produce more. This gives these countries a competitive advantage over their rivals in the export market and helps them to specialize in these particular goods.
- Difference in Demand: Demand is largely a function of income levels and taste patterns. In high-income countries, demand is high, and so is price. In low-income countries, demand is low, and so is price. Naturally, a high-price country would like to import from low-price countries. The producers in low-price countries would like to export to higher-price countries and increase their profit. Similarly, goods move to the countries where people have tastes for them because producers can get high prices for their goods from the people of these countries.

Advantages of International Trade

International trade is an economic phenomenon of vital importance and has always played an important role in the economic life of nations throughout world history. We identify below some of the major advantages of international trade.

- Variety of Goods: International trade enables a country to consume a larger variety of goods than would be available otherwise to its population.
- Availability of Raw Material and Specialised Goods: A country is able to acquire those commodities through international trade which it cannot produce at home. For example, raw material and mineral resources are not available in all countries. Raw materials which are not available within a country can be imported through international trade. Similarly, many commodities can be grown only under particular climatic conditions or in certain soils. Most of the countries of the world, therefore, depend upon international trade to obtain of these commodities.

- Specialization and Division of Labour: International trade enables different countries of the world to exploit the advantages of division of labour and specialization.
- Increase in Efficiency through Widening of Market: International trade is a means by which efficiency in the economy increases. International trade widens the extent of the market. Consequently, every country attempts to produce goods in large quantities. This induces production on large scales, and thereby generates economies of scale.
- Cheaper Goods: International trade lowers the prices of goods and services all over the world, due to lower costs of production.
- Competition: International trade encourages countries to compete with each other. Competitiveness stimulates productivity. It also reduces monopolistic exploitation of consumers.
- Optimum Allocation of Resources: International trade leads to optimum allocation of resources. Under a system of free trade, a country can sell its products in those markets where it can get the best price for its products, and it can buy its requirements from the cheapest source of supply.
- Vent for Surplus Production: International trade enables every country to dispose of its surplus production. As a result, a country is able to avoid the possibility of deflationary pressure which may arise because of unsold stocks of goods.
- Possibility of Economic Development: International trade can be an important vehicle for promoting economic development. Developing countries are able to initiate economic development by importing machinery and technical know-how from developed countries.

Basis of International Trade

What is the basis of international trade? Or why do different countries trade with one another?

We have two different explanatory principles or theories.

i Adam Smith's Theory of Absolute Cost Difference

ii David Ricardo's Theory of Comparative Cost

I Theory of Absolute Cost Difference (Adam Smith)

This theory is also known as the theory of absolute advantage. According to this theory, the fundamental basis of international trade is the difference in absolute cost. An absolute cost difference arises when one country can produce a commodity at a lower cost compared to another country, and the other country can produce some other commodity at a lower cost compared to the first country. Thus, an absolute cost difference arises when each of the two countries can produce some commodities at an absolutely lower production cost than the other.

This may be because each country possesses a special kind of soil, climatic conditions, human resources and technology. Consequently, a country tends to specialize in producing that particular commodity which it can produce at an absolutely lower cost and exports it to other countries. Similarly, it imports the other commodity, which it produces at a higher cost. To put it differently, if one country has an absolute advantage (in cost of production) in the production of one commodity and another country has an absolute advantage in the production of another commodity, each country should specialise in the production of that commodity for which it enjoys the absolute advantage and import the commodity for which it has the absolute disadvantage.

The theory of absolute cost difference (or absolute advantage) can be illustrated through a simple two-country two-commodity hypothetical example as given in Table 9.1

Table 9.1: Absolute Cost Difference (Production of One Labourer in One Day)

Country	Coffee	Wheat
India	4	8
Ethiopia	8	4

It is clear from Table 9.1 that labourer can produce 4 units of coffee and 8 units of wheat in India, whereas in Ethiopia 1 labourer can produce 8 units of coffee and 4 units of wheat. Wheat can be produced more cheaply in India and coffee more cheaply in Ethiopia. India has an absolute advantage in producing wheat and an absolute disadvantage in producing coffee. In the same way, Ethiopia has an absolute advantage in producing coffee and an absolute disadvantage in producing wheat. Hence, India would specialise in the production of wheat and export it in exchange for coffee from Ethiopia. On the other hand, Ethiopia would produce and export coffee to India in exchange for wheat.

II Theory of Comparative Cost (David Ricardo)

This theory is also known as theory of comparative advantage. Now consider a situation in which one country can produce both commodities at a lower cost than the other country. In this case, the first country has an absolute advantage in the production of both of the commodities, and the other has an absolute disadvantage in the production of both commodities. Trade in such a situation is better explained with the use of the theory of comparative advantage.

A comparative difference in costs means that one country can produce both goods at an absolutely lower cost than a second country can, but the first country's cost for the production of one of those goods is comparatively lower than its cost of producing the other good. The second country produces both goods at an absolutely higher cost than the first country does, but it has less of a comparative disadvantage in the production of one good than in the production of the other good.

According to the theory of comparative cost, a country tends to specialise in the production of those goods for which it has lower comparative costs. To put it differently, a country tends to specialize in the production of those goods for which it has greater comparative advantage. Thus, a country would produce and export the product for which its advantage is more, or in which it has a comparative advantage, and import the commodity in which its advantage is less, or in which it has comparative disadvantage.

The theory of comparative cost (or comparative advantage) can be illustrated through the simple hypothetical example in Table 9.2.

Table 9.2: Comparative Cost Difference (Production of One Labourer in One Day)

Country	Coffee	Wheat
India	20	8
Ethiopia	8	4

It is clear from Table 9.2 that India can produce both coffee and wheat at a cheaper cost — i.e., it is more efficient than Ethiopia in the production of both goods, but India's efficiency in the production of coffee is two and a half times more than that of Ethiopia, while in the production of wheat it is twice as much. Cost being reciprocal to efficiency, the per-unit cost of the production of coffee in India is two and a half times less than that of Ethiopia, while the cost per unit of wheat in India is half that of Ethiopia.

Thus, relative productivity ratios for wheat and coffee in India are:

Relative Productivity Ratios for Coffee

$$= \frac{\text{In India 20 Units of Coffee}}{\text{In Ethiopia 8 Units of Coffee}} = \frac{20}{8} = 2.5$$

Relative Productivity Ratio for Wheat

$$= \frac{\text{In India 8 Units of Wheat}}{\text{In Ethiopia 4 Units of Wheat}} = \frac{8}{4} = 2$$

Thus, it will be to the advantage of India to specialize in the production of coffee, in which it enjoys greater relative efficiency or greater comparative advantage over the other country.

Likewise, it can also be proved that Ethiopia has a comparative advantage (or less of a comparative disadvantage) in the production of wheat. Thus according to this example India should produce and export coffee, and Ethiopia should produce and export wheat.

Concepts, Components and Impacts of Foreign Trade

As we know, foreign trade refers to the exchange of goods and services among different countries of the world. It has two components, namely, **exports** and **imports**.

The goods and services that enter into a country in the form of purchases from other countries are called **imports**. On the other hand, goods and services that leave the country's frontiers as sales by that country (or as purchases by other countries) are called **exports**. The value of exports (i.e., money value of all goods exported) plus the value of imports (i.e., money value of all goods imported) during a given year is called the **value of trade**. On the other hand, the physical quantities of goods exported plus those imported in a year, is called the **volume of trade**. Based upon comparisons between the imports and exports of a country, we have three different cases for the foreign trade of a country.

- When the value of exports is more than that of imports, the country is said to have a trade surplus or favourable (or positive) foreign trade.
- When imports are more than exports, the country is said to have a trade deficit, i.e., unfavourable (or negative) foreign trade.
- When the value of exports equals the value of imports, we call it a trade balance.

Trade Restrictions

As a measure towards protection of domestic industries of a country, sometimes restrictions are imposed on foreign trade, particularly on imports. These restrictions are broadly of two types.

- Tariff Restrictions: Tariff restrictions are in the form of taxes on the import of goods, called custom duty or import duty. Such taxes raise the price of imported goods in the domestic market. These high prices of imported goods are expected to reduce their demand in the domestic market and thus to act to restrict imports.
  - Tariff increases government revenue.
- Quantitative Restriction (Import Quota): These restrictions take the shape of fixing the maximum quantity of goods that is permitted to be imported. Thus, the government may determine the total import quota of goods, i.e., the total amount of goods that can be imported, and can allot this quota to various importers. Nothing beyond the quota is allowed to be imported. This naturally limits the quantity of imports.

Mode of Payments in Foreign Trade

Every country exports and imports goods as a normal part of its economic activity. A country receives payment for goods that it sells to foreign countries. The payments for such goods by the foreign purchasers are made in their own country's currency (foreign currency) and hence the exporting country receives foreign exchange (foreign currency) for goods that it exports. Similarly, for whatever a country imports from foreign countries, it has to make payment for these purchased goods in a foreign currency acceptable to the foreign sellers because the local currency might not have any value in the sellers' country. Thus, imports lead to payments in foreign currency, and exports of goods give rise to receipts of foreign currency to a country. The difference between the amount of foreign currency received on account of export of goods and the payment made for import of goods is called **balance of trade**. The balance of trade may be expressed in terms of foreign currency such as US dollars or in terms of domestic currency (Birr in the case of Ethiopia).

Impact of Foreign Trade on an Economy

We have already discussed in the advantages of international trade (or foreign trade), which gives us an idea of the impact of foreign trade on an economy. It may be re-emphasised here that international trade has a very significant role

to play in the economic growth of nations. The following points indicate how foreign trade acts as an engine of growth for an economy.

- Since international trade results in increasing output and income of nations, it obviously leads to economic growth. Thus, through trade, the world economy can achieve a more efficient allocation of resources and a higher level of well-being of its people.
- The developing countries can take advantage of the superior technology of advanced countries. It is possible only when the former import capital goods from the latter.
- When developing countries establish trade relations with advanced countries, the former are not only able to procure advanced technology but the latest technical know-how and managerial skills, which are extremely important for growth.

Thus, if each nation specializes according to its resource endowments and enters into trade with other nations, the world economy and the economy of each of these trading partners can achieve greater output and income and can maintain a higher level of economic growth.

Impact of Foreign Trade on GDP

As we know from the previous unit,

GDP = C + Ig + G + (X – M),

Where C = Consumption expenditure by households,

Ig = Gross Investment expenditure by firms,

G = Government expenditure on goods and services and

X – M = Exports – Imports = Net exports

Since net exports (X – M) is a component of GDP, foreign trade balance impacts GDP. There are three possible situations.

- When exports are more than imports (X > M) i.e., the country has a trade surplus — GDP rises.
- When imports are more than exports (X < M) i.e., the country has a trade deficit — GDP falls.
- When exports and imports are equal (X = M) i.e., the country has a trade balance — GDP is not affected by foreign trade.

Activity 9.1

1 Find out about the major exports and imports of Ethiopia and make a list of the export items and import items.

2 Collect available information from the internet and other sources to prepare a brief report on Ethiopia's major trading partners.

3 With your friends, discuss the major cause of Ethiopia's balance of trade deficit.

4 Examine the role played by international trade in the economic growth of nations.

5 What do you mean by comparative difference in cost of production?

9.2 BALANCE OF PAYMENTS

At the end of this section, you will be able to:

- define balance of payments;
- define and identify the components of current account;
- define trade balance and show how trade balance is computed;
- define net services;
- define current account balance;
- identify the components of current account balance;
- compute and interpret change in countries — assets held abroad; and
- compute and interpret change in foreign assets held in a country.

Key Terms and Concepts

- Trade balance
- Net service
- Current account
- Capital account
- Direct investment
- Portfolio investment
- Private transactions
- Official transactions

Startup Activity

Ethiopia imports commodities much more than its exports. How do you think we can measure such a gap?

Meaning of Balance of Payments

The principal tool for the analysis of the monetary aspects of international trade is the balance of international payments statement. This statement, also simply

known as the balance of payments (BOP), is a systematic record of all international economic transactions, visible and invisible, of a country during a given period, usually a year. In other words, the statement is a device for recording all the economic transactions within a given period between the residents of a country and the residents of other countries.

All payments and receipts of foreign exchange arising from such transactions are listed in the balance of payments account. It is, thus, a complete statement of a country's payments and receipts of foreign exchange in the given period of one year. Note that the trade of merchandise (goods) is only one of the many items on account of which a country makes payment or receives it. There are many other items, such as shipping and insurance services, interest and dividends, tourist traffic, etc., which give rise to payments or receipts of foreign exchange. They too are recorded, along with many others, to make a complete statement of accounts of how much foreign currency a country has to pay and how much of it is to receive in a given year.

Balance of payments accounts are prepared using the double-entry system of accounting, in which the sum of all debits equals the sum of all credits, and the accounts are always in balance. If a transaction earns foreign currency for the country, it is called a credit and is recorded using a plus sign. On the other hand, if a transaction refers to a spending of foreign currency by the country, it is called a debit and is recorded in BOP accounts using a minus sign.

In other words, all receipts of foreign currency are credit items, whereas all payments of foreign currency are debit items. If the total of the debit items and the total of the credit items are equal in value, the country's international payments are balanced. If the credit items are larger, so that there is a net balance due to it, the country is said to have a favourable balance. If the debit items are larger, so that there is a net balance due to foreigners, the country is said to have an unfavourable balance. Although, the terms "favourable" and "unfavourable" are misleading, they have the sanction of long usage.

Components (or Elements) of BOP

The balance of payment account is divided into two parts:

i. Current account
ii. Capital account

© MoE FDR Ethiopia Not to be republished

I Current Account

The current account records inflows and outflows of foreign currency resulting from flows of goods, flows of services and unrequited (or unilateral) transfers. Accordingly, a current account has three parts — trade balance, net services, and net transfers.

- Trade Balance: The difference between the export and import of goods is called the trade balance. The export and import of goods is also called visible trade, since goods are visible items.
- Net Services: The difference between the export and import of services is called net services. There are many services that are made use of in international trade, for example shipping, insurance and banking services. Ships have to be hired for transporting goods from one country to another. The merchandise carried by the ships has to be insured for any loss and damage in transit. Banking services are used to facilitate receipts from and payments to foreign dealers. When foreign ships (for example, ships from a company in the USA) are hired by a country to bring in goods imported from the USA, then, in addition to the payment for the import of goods, payment has to be made to the US shipping company in foreign currency. Conversely, if foreign countries use the services of, say, Ethiopian insurance companies and banks, Ethiopia will receive foreign currency from such countries on account of these services. Nowadays, tourism and travel among countries has also become an important item on balance of payments. When foreign tourists come to Ethiopia, they bring foreign currency in with them and convert it into our currency to spend it in our domestic market. The country thus receives foreign currency. Similarly, when Ethiopian tourists go abroad, they have to convert Ethiopian currency into foreign currency to spend it abroad. This involves an outflow or payment of foreign exchange.

We may conclude that the difference between the inflow and outflow of foreign currency as a result of the export and import of services, such as banking, insurance, transport, tourism, etc., constitutes what we call net services. Note that the export and import of services is called invisible trade.

- Net Transfers: Transactions such as gifts, remittances, donations, etc., are unrequited or unilateral receipts and payments, because residents of a country receive them 'for free'. Nothing has to be paid in return, either at present or in the future, for such receipts. The difference between the receipts and payments of such transfers is known as net transfers.

The sum total of the above mentioned three components-trade balance, net services, and net transfers-is called balance of payments on current account or simply current account balance (CAB).

Remark: If total receipts on the current account of balance of payments are more than the total payments, there is said to be a surplus in the current account. But if payments exceed receipts, the current account is said to be in deficit. The deficit in the current account of balance of payments means that the country has, during the year, spent more than what it earned in the form of foreign exchange. But how can a country spend more than what it has earned? It can do so only by borrowing from others, or finding some other avenues to get foreign exchange. These borrowings, loans, investments, etc., form the capital account of balance of payments.

II Capital Account

The capital account of BOP records all such transactions between residents of a country and the rest of the world which cause a change in the assets or liability status of residents of a country or its government. It represents the international flow of loans and investments that change the country's foreign assets and liabilities. A capital account is made up of two major parts: the country's assets held abroad (which are recorded as a negative entry) and assets held by foreigners in the country (recorded as a positive entry). The sum total of these two components gives the balance of payments on capital account or simply the capital account balance

Various forms of capital account transactions are as given below:

- Private Transactions: These are transactions which affect the assets and liabilities of individuals, businesses, and other non-government entities.
- Official Transactions: These include transactions affecting the assets and liabilities of the government and its agencies.
- Direct Investment: It means purchasing an asset and, at the same time, acquiring control of it. For example, the acquisition of a firm in one country by a firm in an other country or the purchase of a house by individuals abroad.
- Portfolio Investment: It is the acquisition of an asset that does not give the purchaser control over the asset. Examples are the purchase of shares in a foreign country or the purchase of bonds issued by a foreign government.

Remark: Many times there are some omissions from and errors in balance of payment accounts. Such an omission or error is known as a statistical discrepancy. Statistical discrepancies are normally included in the capital account so as to make the net capital account balance equal to and opposite of the net balance on the current account.

Balance of Payments: Complete Account

By adding the balance on the capital account and the balance on the current account, we get the complete balance of the payments account. When receipts and payments are equal, the balance of payments is said to be in balance. If the total BOP receipts are more than the payments, the excess goes to a third account, the Foreign Exchange Reserves. And when payments exceed receipts, there is a depletion of foreign exchange reserves.

Activity 9.2

1 Given below is a table that shows Ethiopia's account balance, as a percent of GDP, between 2003/04 and 2007/2008. Study the table and make your observations about the trends in exports, imports, trade balance, etc.

Table 9.3: Ethiopian Current Account (as percent of GDP) 2003/04 – 2007/08

Item	2003/04	2004/05	2005/06	2006/07	2007/08
Trade balance	–19.8	–22.6	–23.7	–20.2	–20.1
Exports of goods (f.o.b.)	6	6.9	6.6	6.1	5.5
Imports of goods (c.i.f.)	25.7	29.5	30.3	26.2	25.6
Net services	3.08	2.25	0.98	0.82	0.47
Factor income	–0.63	–0.29	–0.01	0.15	0.13
Current transfers	13.3	14.4	13.8	14.8	13.9
Current Account Balance (including official transfers)	–4.0	–6.3	–8.9	–4.4	–5.6

Source: NBE

2 The following table shows Ethiopia's BOP accounts from the year 1999/2000 to 2004/05. Study the table and identify the major trends in

a Current account
b Capital account
c Overall balance

Table 9.4: Ethiopia's Balance of Payment (in millions of USD) 1999/2000 – 2004/2005

Description	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05
Exports	222.4	279.6	453.6	410.2	604.4	600
Imports	1051.8	914.6	1063	1412.9	1403.1	1450.5
Trade balance	–829.4	–635.1	–609.4	–1002.7	–798.7	–850.5
Net services	–23.1	10.9	60.8	95.1	99.6	88.7
Private transfers	247.9	246.9	311.2	313.4	251.8	334.1
Current account balance	–604.6	–377.2	–237.4	–594.2	–448.7	–427.8
Capital account	–128	236.3	8.6	–11.3	–54.9	174.8
Errors and omissions	233.5	23.6	–37.1	124.7	–116.9	–145.9
Overall balance	–98.9	167.7	161.6	–89.1	–386.7	–107.5

Source: NBE

9.3 FOREIGN EXCHANGE RATES

At the end of this section, you will be able to:

- assess the impact of foreign trade on the economy;
- classify exchange rates;
- define fixed exchange rate and identify the types of fixed exchange rates;
- define the revaluation and devaluation of fixed exchange rates;
- explain what floating exchange is; and
- distinguish the differences between appreciation and depreciation floating exchange rate.

Key Terms and Concepts

- Foreign exchange
- Revaluation
- Devaluation
- Appreciation
- Deppreciation

Startup Activity

Discuss the impacts of foreign exchange rate on the balance of payments of a country.

Every country has its own currency which is used as a medium of exchange within the national borders of that country (and not outside the country). For instance, the currency of Ethiopia is the Birr, of America it is the US dollar, that of the UK is the British pound, that of Japan is the Yen, etc. There is no problem of payment

transactions (sales and purchases) are made within the national border of a country. For instance, if a seller in Addis Ababa sells goods to a buyer in Dire Dawa, he/she is paid in birr. There is no problem because both use the same currency.

But if a seller sells goods to a buyer in England, the problem of foreign currency occurs because the seller wants to receive payment in birr, whereas the buyer wants to pay in pounds. Payments across national borders give rise to a new situation that of international payments. Currency which is used for making international payments is called Foreign Exchange. Thus foreign exchange refers to all currencies other than the domestic currency of a given country. For instance, for Ethiopia, all currencies other than birr are foreign exchange, and similarly for America, all currencies other than its US dollar are foreign exchange. Now this problem arises: at what rate should currencies of two countries be exchanged? We discuss this in the following paragraphs.

Foreign Exchange Rate and its Types

Foreign Exchange Rate

The price of one currency in terms of another is known as their foreign exchange rate. It is the rate at which one unit of a foreign currency is exchanged for domestic currency. Since there is symmetry between two currencies, their exchange rate can be quoted in two ways, i.e., foreign currency expressed in terms of domestic currency or domestic currency expressed in terms of foreign currency.

There are various concepts of exchange rate systems. Its two broad types are Fixed Exchange Rate and Floating Exchange Rate. In between these two extreme rates, there are some hybrid systems like Crawling Peg, Managed Floating, Adjustable Peg, etc.

Fixed Exchange Rate

The fixed exchange rate is the rate which is officially fixed (or pegged) in terms of gold or any other currency by the government and adjusted only infrequently Only a very small deviation from this fixed value is possible. In this system, foreign central banks stand ready to buy and sell their currencies at a fixed price. In case there is disequilibrium in the balance of payments, causing excess demand or excess supply of foreign exchange, the central bank of the country has to buy or sell the quantities of foreign exchange required to eliminate the excess demand or supply.

Remark: The value of a currency fixed in terms of another currency or in terms of gold is known as the parity value of the currency

Floating Exchange Rate

The floating exchange rate is the rate which is determined by forces of supply and demand in the foreign exchange market. There is no (official) government intervention. Here the value of a currency is to be left completely free to be determined by market forces of demand and supply of foreign exchange. Under this system, the central banks, without intervention, allow the exchange rate to adjust so as to equate the demand and supply for foreign currency. The foreign exchange market is busy at all times with changes in the exchange rate. Just like the market price of a commodity, the exchange rate of a currency is determined by demand and supply of foreign exchange in a freely fluctuating exchange market.

Changes in the Value of a Currency

The value of a currency in terms of foreign currency may increase or decrease under these two systems of exchange rate, i.e., fixed and floating. Under the fixed exchange rate system, these changes take place as a result of a policy decision by the monetary authority (government) of the country, whereas under the floating exchange rate system, these changes are the result of changes in the demand and supply of the currency in the free exchange market.

Under a fixed exchange regime, when a country raises the value of its currency in terms of foreign currency, it is called revaluation. On the other hand, when a country brings down the value of its currency in terms of foreign currency it is called devaluation. For example, in 1983 E.C., the Ethiopian transitional government devalued the exchange rate of birr from birr 2.07 per US dollar to birr 5 per US dollar. Thus, because of devaluation, more birr were required to buy one US dollar, i.e., the value of birr in terms of dollar went down.

Under the floating exchange rate system, an increase in the value of a currency in terms of foreign currency is called appreciation. On the other hand, a fall in the value of a currency in terms of foreign currency is called depreciation.

© MoE FDRE Ethiopia Not to be republished

Remarks:

- Under the floating exchange system, the exchange value of a currency frequently appreciates or depreciates, depending upon the change in the demand for and supply of the currency in the free exchange market.
- Managed Floating: Managed floating is a hybrid of the fixed and floating exchange rate systems. It is characterised by some intervention in the exchange rate movements by the government of the country when a particular situation requires it. Currently, the exchange rate of the birr is determined by the managed floating exchange rate system.
- The US dollar, British pound, French franc, and Japanese yen are considered to be strong or hard currencies because, worldwide, people have faith in their general acceptance as money. The Ethiopian birr and currencies of other developing countries are called soft currencies since their exchange value is weak.

Impacts of Foreign Exchange Rate on BOP

The balance of payments account of a country largely indicates the monetary aspect of its foreign trade, i.e., exports and imports. Also exports earn foreign currency for a country, whereas imports imply the spending of foreign currency by the country. Naturally, change in the value of the currency of the country, in terms of foreign currency, has an impact on its balance of payments. An increase in the value of the currency of a country makes its imports cheaper and its exports costlier (for foreign countries). In such a situation, imports increase and exports decrease, thus leading to a trade deficit, i.e., an unfavourable balance of payments. On the other hand, a decrease in the value of the currency of a country in terms of foreign currency, makes its imports costlier (for the local buyers) and exports cheaper (for the foreign buyers). In this situation, imports decrease and exports increase, thus leading to a trade surplus or favourable balance of payments.

Thus, for example, under a fixed exchange rate system

- if countries face a deficit in trade balance, they devalue their currency.
- if countries have a surplus in their trade balance, they revalue their currency.

Activity 9.3

Make a search of sources, such as the internet and others, to gather information and then prepare a brief report on changes in the exchange rates of the Ethiopian birr during recent times.

UNIT SUMMARY

- International trade refers to the exchange of goods and services among different countries of the world.
- Factors determining international trade:
  - Unequal distribution of natural resources,
  - unequal distribution of population,
  - unequal distribution of capital,
  - Level of technological development,
  - Increasing returns to scale,
  - Difference in demand.
- Advantages of international trade:
  - Variety of goods,
  - Availability of raw material and specialized goods,
  - Specialization and division of labour,
  - Increase in efficiency through widening of market,
  - Cheaper goods,
  - Competition,
  - Optimum allocation of resources,
  - Vent for surplus production,
  - Possibility of economic development.
- Theory of absolute advantage: if one country has an absolute advantage (in cost of production) in the production of one commodity, and another country has an absolute advantage in the production of another commodity, each country should specialise in the production of that commodity for which it enjoys absolute advantage and import the commodity for which it has absolute disadvantage.
- Theory of comparative advantage: a country tends to specialise in the production of those goods in which it has comparative advantages.
- When exports are more than imports, a country is said to have a trade surplus.
- When imports are more than exports, a country is said to have a trade deficit.

- When the value of exports equals value of imports, we call it a trade balance.
- Tariff restrictions and import quota are two broad types of trade restriction.
- Balance of payments (BOP), is a systematic record of all international economic transactions, visible and invisible, of a country during a given period, usually a year.
- Current account and capital account are two main components of BOP.
- Current account records inflows and outflows of foreign currency that result from flows of goods, flows of services and unrequited (or unilateral) transfers.
- The capital account of BOP records all such transactions between the residents of a country and the rest of the world which cause a change in the assets or liability status of the citizens of a country or of its government.
- Foreign exchange refers to all currencies other than the domestic currency of a given country.
- The price of one currency in terms of another is known as the foreign exchange rate .
- Fixed exchange rate is the rate which is officially fixed (or pegged) in terms of gold or any other currency by the government and adjusted only infrequently.
  - When a country raises the value of its currency in terms of foreign currency, it is called revaluation.
  - When a country brings down the value of its currency in terms of foreign currency it is called devaluation.
- Floating exchange rate is the rate which is determined by forces of supply and demand in the foreign exchange market.
  - An increase in the value of a currency in terms of foreign currency is called appreciation.
  - A fall in the value of a currency in terms of foreign currency is called depreciation.
- Managed floating is a hybrid of the fixed and floating exchange rate systems.
- Currently, the exchange rate of Birr is determined by the managed floating exchange rate system.
- A change in the value of the currency of a country in terms of foreign currency impacts its balance of payments.

REVIEW EXERCISE FOR UNIT 9

I Write detailed answers to the following questions and instructions.

1 What do you mean by international trade? Discuss its advantages. Provide examples.

2 Describe the major factors determining international specialisation in the production of goods.

3 Discuss the theory of absolute advantage as a basis of international trade. Provide a suitable example.

4 What do you mean by comparative difference in cost of production? Explain the theory of comparative advantage. As part of your explanation, provide examples.

5 Discuss the meaning of trade balance, trade deficit, and trade surplus in the context of foreign trade.

6 Discuss the ways and measures used by a country to restrict imports.

7 Examine the role played by international trade in the economic growth of nations.

8 Explain how foreign trade affects the GDP of a country.

9 What do you mean by balance of payments? Discuss its major components.

10 What do you mean by foreign exchange rate? Describe how it is determined under the fixed exchange rate and floating exchange rate systems.

11 Describe the meaning of the concepts of revaluation and devaluation, as used under the fixed exchange rate system.

12 Discuss the impacts of foreign exchange rate on the balance of payments of a country.

II Distinguish between the following:

13 Appreciation and revaluation

14 Depreciation and devaluation

15 Fixed exchange rate and floating exchange rate

16 Balance of trade and balance of payments

III Label each of the following as 'True' or 'False':

17 International trade narrows the extent of the market.

18 A country imports the commodity for which it has an absolute disadvantage.

19 A country tends to specialise in the production of those goods for which it has comparative advantages.

20 The goods and services that enter into a country in the form of purchases from other countries are called exports.

21 When imports are more than exports, the country is said to have a trade surplus.

22 Trade restrictions are a measure to protect domestic industries of a country.

23 The birr is considered to be a soft currency.

24 The Japanese yen is considered to be a strong currency.

25 Export and import of material goods is invisible trade.

26 An increase in the value of a currency in terms of foreign currency is called appreciation.

IV Match the following:

27	International trade	A	Trade surplus
28	X > M	B	Currencies other than domestic currency
29	M > X	C	Revaluation
30	Foreign exchange	D	Depreciation
31	Rise in value of currency	E	Engine of economic growth
32	Fall in value of currency	F	Trade deficit

V For each of the following, four choices are given, but only one is correct. Choose the correct one.

33 Equality between exports and imports implies:

A trade deficit
B trade surplus
C trade balance
D none of these

34 International trade increases:

A consumption of goods and services
B efficiency of an economy
C specialization of labour
D all of these

35 The sum total of the money value of exports and imports is known as:

A volume of trade
B value of trade
C total trade
D none of these

36 Which of the following is a soft currency?

A Indian rupee
B US dollar
C British pound
D French franc

37 An increase in the international value of the currency of a country:

A makes its imports costlier
B makes its imports cheaper
C makes its exports cheaper
D none of these

VI Write very short answers to the following questions and instructions:

38 List two factors that determine international trade.

39 Name the two theories that explain the basis of international trade.

40 Name two export items of Ethiopia.

41 How does a surplus of imports over exports of a country affect its GDP?

42 Name the three components of a current account.

43 Name the two elements of BOP.

44 What types of transaction are recorded with a minus sign in BOP accounts?

45 Name an element of a current account which is treated as invisible trade.

46 Given that trade balance = Birr (–) 400 million, and the value of exports = Birr 300 million, find the value of imports.

47 What are the two major parts of a capital account?

48 If the exchange rate of birr in terms of the US dollar falls, what will be the impact on Ethiopia's imports?

49 What do you mean by statistical discrepancy?

50 What do you mean by parity value of a currency?

51 Which items are included in the visible trade of a current account?

52 What do you mean by net services?

10

Unit Objectives

After completing this unit, you will be able to:

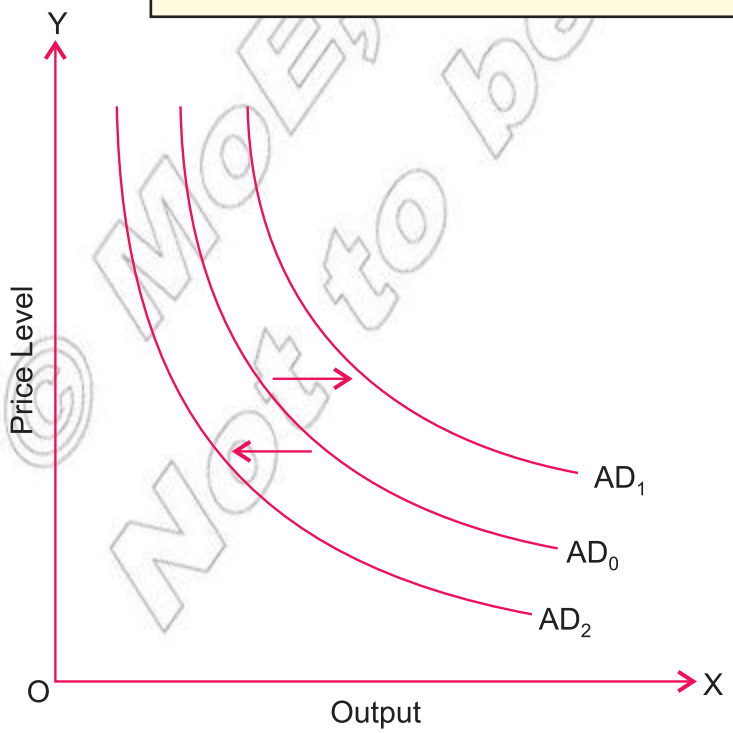
- realize the difference among fiscal, monetary and income policy;
- distinguish the difference between expansionary, fiscal and expansionary monetary policy; and
- explain income policy.

Main Contents

10.1 DETERMINATION OF LEVELS OF OUTPUT, PRICES AND EMPLOYMENT

10.2 MACROECONOMIC POLICIES

- Unit Summary
- Review Exercise



© MoE Not to be republished

INTRODUCTION

Every economy aims at achieving certain well-defined targets relative to its national income and output. Not only that, economies over the world also strive for a full employment level, stability in prices, and equality in the distribution of income and wealth. How do they plan to achieve all this? How are the obstacles to these targets removed? What sorts of macroeconomic policies do they adopt? And how do these policies work? This unit gives us introductory-level answers to some of these questions. Specifically, we learn here about the objectives, types, and instruments of major macroeconomic policies.

10.1 DETERMINATION OF LEVELS OF OUTPUT, PRICES, AND EMPLOYMENT

At the end of this section, you will be able to:

- identify the mechanism used to determine the level of overall economic activity and
- distinguish the difference between aggregate demand and aggregate supply.

Key Terms and Concepts

- Aggregate demand
- Aggregate supply

Start-up Activity

What important idea comes to your mind when you think of aggregate demand and aggregate supply in an economy?

In macroeconomic analysis we determine the level of overall economic activity in an economy, particularly the levels of output, prices, and employment through an interaction of aggregate demand and aggregate supply. Hence it is necessary that we understand the meaning of these two terms.

Aggregate Demand (AD)

In general terms, aggregate demand refers to the total demand for goods and services in the economy. Because it is measured by total expenditure of the

economy's community on goods and services, aggregate demand is defined as

> "The total amount of money which all sections (households, firms, and government) are ready to spend on the purchase of goods and services produced in an economy during a given period"

Alternatively, AD is the total expenditure which the community intends to incur for the purchase of goods and services. Thus aggregate demand is same as aggregate expenditure in the economy. We may say Aggregate Demand is the total expenditure on consumption and investment. The main components of aggregate demand are:

- Private (household) consumption demand (C)
- Gross Private investment demand (Ig)
- Government demand for goods and services (G)
- Net export demand (X – M)

So that,

$$AD = C + Ig + G + (X - M) \qquad (10.1)$$

In general, it is observed that, with other factors held constant, aggregate demand rises with a fall in general price level. The inverse is also true. Thus AD curve is a downward sloping curve. It indicates the output (goods and services) which will be demanded in the economy at various general price levels.

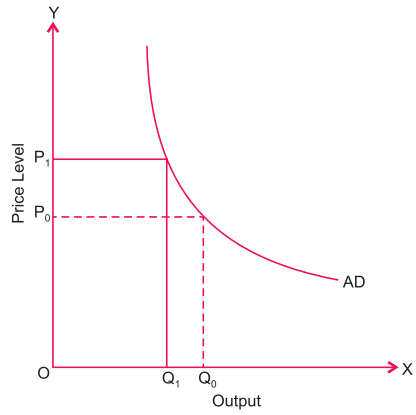


Figure 10.1: Aggregate Demand Curve

The above figure shows that, when the general price level falls from P_1 to P_0, the aggregate quantity demanded of the output increases from Q_1 to Q_0. Hence, there is an inverse relationship between the general price level and aggregate demand. Recall what we learnt in an earlier unit about the relationship between the price of an individual commodity and its demand (Law of Demand).

© MCERT not to be republished

Factors that Determine Aggregate Demand

In the same way as for the general price level (as discussed above), aggregate demand in an economy depends upon the monetary and fiscal policies of the government and also on all other factors which determine the demand for consumption, investment, and exports. These factors include:

- general level of income of the people
- real interest rate
- level of economic activity in other countries (it determines the level of exports)
- availability of credit, and
- the level of economic activity in the economy itself.

General price level remaining constant, any positive change in any of these factors causes a rightward shift in the AD curve, and a negative change shifts the AD curve leftward.

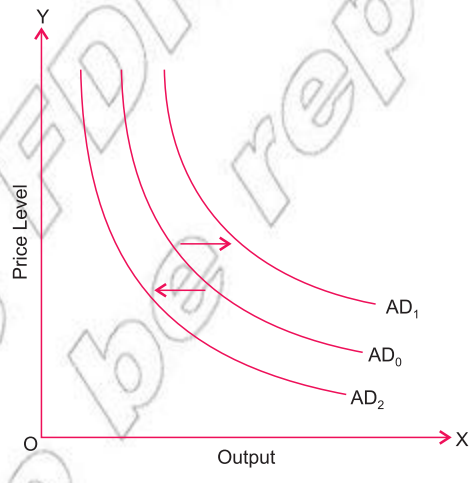


Figure 10.2: Shift of AD Curve

Aggregate Supply (AS)

Aggregate supply refers the total output that the producers in an economy are willing and able to produce and sell in a given period of time at a given level of prices and costs

In other words it is the value of total output available for purchase by the economy during a given period of time. Since aggregate supply represents the value of total output, we may say it is reflected by national income.

In general, other factors remaining constant, a rise in general price level increases the aggregate supply. The inverse is also true. Thus the AS curve is an upward sloping curve as shown in the following diagram.

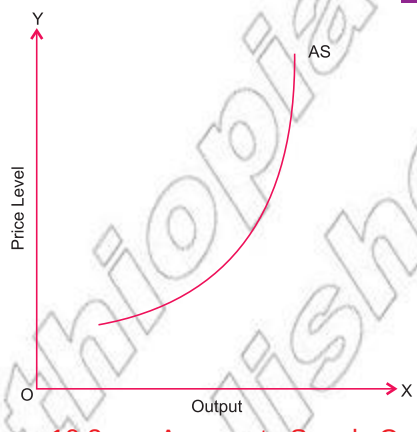


Figure 10.3: Aggregate Supply Curve

Factors that Determine Aggregate Supply

As far the general price level, aggregate supply in an economy depends upon several other factors that include:

- cost of inputs,
- availability of capital and labour,
- managerial efficiency,
- state of technology,
- taxation policy of the government, and
- weather conditions (applies particularly to agricultural output).

Similar to the case of the aggregate demand curve, any change in any of these factors causes a shift in the aggregate supply curve, general price level remaining constant.

Interaction Between Aggregate Demand and Supply

Earlier we learned that interaction between market demand and market supply determines the equilibrium level of output and prices of individual commodities. In the case of macroeconomic analysis also, it is the interaction between aggregate demand and aggregate supply which determines the equilibrium level of national output and the general price level.

In the following diagram, the AD and AS curves intersect each other at point E, which determines the equilibrium level of output and price level. Note that the output (and employment) at equilibrium level, may not be equal to the output at potential level of the economy (full employment).

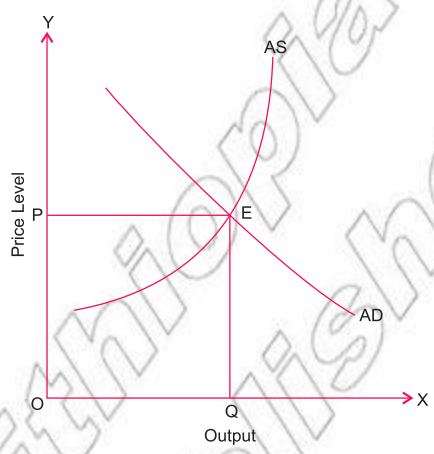


Figure 10.4: Equilibrium between Aggregate Demand and Aggregate Supply

Activity 10.1

1 In the same way as we say 'Aggregate Demand is aggregate expenditure in the economy,' is it correct to say 'Aggregate Supply is the total factor income in the economy'? Discuss this question in your economics workgroup.

2 Do you think that equality between Aggregate Demand and Aggregate Supply takes place only at the full-employment level? Discuss this question in your economics workgroup.

10.2 MACROECONOMIC POLICIES

At the end of this section, you will be able to:

- define macroeconomic policy instruments;
- identify the types of macroeconomic policy instruments;
- explain and classify fiscal policy;
- distinguish the difference between expansionary and contractionary fiscal policy;
- classify monetary policies;
- state and define monetary policy instruments;
- distinguish the difference between expansionary and contractionary monetary policy; and
- define the concept of income policy.

Key Terms and Concepts

- Fiscal policy
- Expenditure policy
- Revenue policy
- Monetary policy
- Income policy

Start-up Activity

What is the importance of fiscal policy in an economy?

We know that macroeconomic analysis deals with the behaviour of the economy as a whole with respect to output, income, employment, general price level and other aggregate economic variables. With a view to bringing about desirable changes in such variables, nations developed as well developing need to adopt various macroeconomic policies. These policies and the instruments used for their implementation vary from one economy to another and also according to the prevailing economic conditions within a specific economy.

The general objectives of a macroeconomic policy are to achieve:

- maximum feasible output,
- high rate of economic growth,
- full employment,
- price stability,
- equality in the distribution of income and wealth, and
- a healthy balance of payments.

To achieve these objectives, normally three types of macroeconomic policies – fiscal policies, monetary policy, and income policy – are adopted. We discuss below each of these types of policies and their instruments.

Fiscal Policy

Fiscal policy is the expenditure and revenue (tax) policy of the government to achieve the desired objectives. As fiscal policy can be of two types – expansionary or contractionary – depending upon prevailing economic conditions.

I Expansionary Fiscal Policy:

In a situation in which an economy is facing the problem of deficient demand, i.e., aggregate demand falling short of output at full employment, there is a depression marked by overproduction, a rise in unemployment, and a fall in prices and income. To increase the aggregate demand and thereby total output and employment levels, expansionary fiscal policies are adopted by governments.

Major instruments of expansionary fiscal policy are:

- Expenditure Policy (Increase expenditure) the objective of an expenditure policy should be to pump more money in to the system in

order to boost demand. During a period of deficiency in demand, the government should make large investments in public works like the construction of roads, bridges, buildings, railway lines, canals, etc., and should provide free education and medical facilities, even though these activities might enlarge budget deficits. The aim is to put more money in the hands of people so that they would also spend more.

- Revenue Policy (Reduce tax rates): Taxes on personal incomes and taxes on expenditures on buildings etc. should be reduced. If possible, taxes on lower income groups should be abolished in order to increase their disposable income for spending. In addition, subsidies, old age pensions, unemployment allowances and grants, interest-free loans, should be given.
- Government (Public) borrowing: Borrowing should be discouraged.

II Contractionary Fiscal Policy:

When an economy's, aggregate demand is for a level of output that is more than the full-employment level of output, the demand is said to be an excess demand. In other words, excess demand refers to the excess of aggregate demand over the available output at full employment. This gap is called inflationary because it causes inflation (a continuous rise in prices) in the economy. To control the situation of excess demand and there by reduce the pressure of high inflation, contractionary fiscal policies are adopted by governments.

Major instruments of contractionary fiscal policy, are:

- Expenditure Policy (Reduce expenditure): In a situation of excess demand, the government should curtail its expenditures on public works such as roads, buildings, rural electrification, irrigation work, etc., thereby reducing the money income of the people and thus their demand for goods and services. In this way, the government would reduce the budget deficit, which shows excess of expenditure over revenue.
- Revenue Policy (Increase taxes): During inflation, the government should raise rates of all taxes, especially taxes on rich people, because taxation withdraws purchasing power from the taxpayers and, to that extent, reduces effective demand. Care should be taken that measures adopted to raise revenue should be disinflationary and at the same time have no harmful effects on production and savings.
- Government (Public) borrowing: Government should resort to large-scale public borrowing to absorb excess money from the public.

Monetary Policy

Monetary policy refers to the regulation of the money supply and the control of the cost and availability of credit by the central bank of the country through the use of deliberate and discretionary action for achieving desired objectives. As discussed in the case of fiscal policy, a monetary policy can be expansionary or contractionary according to the situation of deficit demand or excess demand, respectively.

Major instruments of expansionary monetary policy, are:

- Bank Rate (Reduce it): Bank rate (also called discount rate) is the rate of interest at which the central bank lends to the commercial banks. Those banks in turn increase or decrease lending rates of interest accordingly. To check depression, the central bank reduces the bank rate, thereby enabling the commercial banks to take more loans from it and in turn to give more loans to producers at lower interest rates.
- Open Market Operation (Buy securities): These refer to the buying and selling of government securities which influence money supply in the economy. During depression, the central bank buys government bonds and securities from commercial banks, pay in cash to increase their cash stock and lending capacity.
- Cash-Reserve Ratio (Reduce CRR): Every commercial bank is required to keep with the central bank a particular percentage of its deposits or reserves in the form of cash. This percentage is called the cash reserve ratio (CRR). During depression, the central bank lowers the CRR, thereby increasing commercial banks' capacity to give credit.

Major instruments of contractionary monetary policy, are:

- Bank Rate (Increase it): In a situation of excess demand leading to inflation, the central bank raises the bank rate. This raises the cost of borrowing, which discourages commercial banks from borrowing from the central bank. An increase in the bank rate forces the commercial banks to increase their lending rates of interest, which makes credit costlier. As a result, the demand for loans falls. The high rate of interest induces households to increase their savings by restricting expenditure on consumption and discourages investment. Thus, expenditure on investment and consumption is reduced, thereby reducing the aggregate demand.

- Open Market Operation (Sell securities): During inflation, the central bank sells government securities to commercial banks, which lose an equivalent amount of their cash reserves, thereby reducing their capacity to offer loans. This absorbs liquidity from the system. As a result, there is a fall in investment and in aggregate demand.
- Cash-Reserve Ratio (Increase CRR): During inflation, the central bank increases the CRR, thereby curtailing the lending capacity of commercial banks.

Income Policy

In general terms, income policy is the government control of wages. Control of wages becomes necessary when there is a situation of excess demand (inflation). Ceilings on wages keep disposable income down, which checks the aggregate demand for goods and services.

However, the government has to devise an appropriate income policy. If an increase of wages were to lead to an increase in productivity of labour, higher wages could be paid to workers. But, a wage increase without improvement in productivity will add further inflationary pressure in the situation of excess demand.

Activity 10.2

1 You know that achieving greater equality in income distribution is one of the major objectives of a macroeconomic policy. Suggest how public (government) expenditure should be controlled in Ethiopia through government fiscal policy so as to achieve this objective.

2 Compile in tabular form the various measures to correct excess/deficient demand. Create this table on chart paper and display your results in your classroom.

3 You have learned about excess demand and deficient demand in this sub-unit. By discussing the meaning of excess demand and deficient demand with your friends, try to identify the various causes that may lead to such situations in an economy.

4 In your economics workgroup, discuss what the roles and objectives of fiscal policy should be in an underdeveloped or developing economy like Ethiopia's. Prepare a report on the outcome of your group discussion.

UNIT SUMMARY

- Aggregate demand refers to the total amount of money which all sections (households, firms, and government) are ready to spend on the purchase of goods and services produced in an economy during a given period.

  $$AD = C + Ig + G + (X - M)$$

- Determinants of AD:
  - price
  - level of income
  - real interest rate
  - level of economic activity in other countries
  - availability of credit.
- The AD curve indicates the output which will be demanded in the economy at various price levels.
- The AD curve is a downward sloping curve.
- Aggregate supply refers to the total output that producers in an economy are willing to produce and sell in a given period of time at a given level of prices and costs.
- Determinants of AS:
  - price
  - cost of inputs
  - availability of capital and labour
  - managerial efficiency
  - state of technology
  - taxation policy of the government
  - weather conditions.
- The AS curve is an upward sloping curve.
- Interaction between AD and AS determines the equilibrium level of national output and price level.
- Types of macroeconomic policies:
  - fiscal policy
  - monetary policy
  - income policy.
- Fiscal policy is the expenditure and revenue (tax) policy of the government.
- Monetary policy is the policy of the central bank related to supply, availability, and cost of money.
- Income policy refers to the control by the government over worker wages.

- Excess demand is a situation in which the AD is for a level of output that is more than the full-employment level of output.
- Deficient demand is a situation in which AD falls short of output at full -employment level.
- Expansionary policies are adopted in the situation of deficient demand.
- Contractionary policies are adopted in the situation of excess demand.
- Major instruments of expansionary fiscal policy:
  - increase of government expenditure.
  - reduction in tax rates.
  - reduction in public borrowing.
- Major instruments of contractionary fiscal policy:
  - reduction in government expenditure
  - increase in tax rates
  - increase in public borrowing.
- Major instruments of expansionary monetary policy:
  - reduction in bank rate
  - buying of securities by the central bank
  - reduction in CRR.
- Major instruments of contractionary monetary policy:
  - increase in bank rate
  - selling of securities by the central bank
  - increase in CRR

REVIEW EXERCISE FOR UNIT 10

I Write detailed answers to the following.

1 Explain, with the help of a diagram, how the equilibrium level of output is determined by aggregate demand and aggregate supply.

2 Define aggregate demand. What are its main components?

3 Explain, with the help of a diagram, the behaviour of aggregate demand and aggregate supply.

4 What are the main objectives of a macroeconomic policy?

5 What is excess demand in an economy? How can fiscal measures be used to correct it?

6 What is deficient demand? Explain any two monetary measures that can control it.

7 What is the difference between monetary policy and fiscal policy? Explain briefly any two measures of fiscal policy which can be used for controlling excess demand.

8 What is the meaning of fiscal policy? Explain how the following affect demand in an economy:

a Change in government expenditure.

b Change in tax rates

9 Explain the various monetary measures by which excess demand in an economy can be checked.

10 What is fiscal policy? What possible fiscal policy measures can be taken, with respect to expenditure and income, to correct:

a excess demand and b deficient demand?

11 What is deficient demand in macroeconomics? How do the following affect it?

a Change in cash reserve ratio b Change in tax rates

12 Explain the concept of inflationary gap. Explain any two measures by which a central bank can try to reduce this gap.

II Distinguish between the following:

13 Fiscal policy and monetary policy

14 Excess demand and deficient demand

III Write 'True' or 'False' each of the following:

15 To correct excess demand, the central bank decreases the bank rate.

16 During depression, the central bank buys government securities.

17 During depression, the central bank lowers the CRR.

18 Expansionary fiscal policies are adopted to reduce aggregate demand.

19 In situations of deficient demand, government expenditure should be curtailed.

20 Government should reduce tax rates to increase aggregate demand.

21 A country faced with the problem of deficient demand should discourage imports.

22 Control of wages becomes necessary when there is a situation of inflation.

IV For each of the following, four choices are given, but only one out of them is correct. Choose the correct one.

23 In the case of inflationary gap:

A AD > AS
B AD = AS
C AD < AS
D None of these

24 Aggregate demand is determined by:

A population of the country
B cost of inputs
C managerial efficiency
D state of technology

25 To control the situation of deficient demand:

A Government expenditure is reduced.
B Tax rates are increased.
C Public borrowing is increased.
D The bank rate is reduced.

26 To control the situation of excess demand:

A The central bank reduces bank rate.
B The central bank sells government securities.
C The central bank decreases CRR.
D None of these.

27 A reduction in bank rate is:

A a contractionary fiscal policy
B an expansionary fiscal policy
C an expansionary monetary policy
D a contractionary monetary policy

V Write very short answers to the following.

28 What happens to the level of income in an economy when there is deficient demand?

29 When does a situation of deficient demand arise in an economy?

30 What do you mean by depression?

31 How is aggregate demand in the economy affected by levying taxes at higher rates?

32 What problem in the economy is solved when the credit supply is restricted?

33 Mention two fiscal measures to correct excess demand.

34 Mention two monetary measures to correct excess demand.

35 Mention two measures to correct deficient demand.

36 What happens when the bank rate is increased?

37 Name two factors that determine aggregate demand.

38 When actual aggregate demand falls short of the aggregate demand required at full employment, what do you call it?

39 What should be the taxation and public expenditure policy in the situation of excess demand?

40 What should be the taxation and public expenditure policy in the situation of deficient demand?

41 What will be the impact of the following on aggregate demand:

- a Increase or decrease in public expenditure
- b Increase or decrease in taxes
- c Increase or decrease in reserve ratio
- d Increase or decrease in interest rate

42 Name two factors that determine aggregate supply.

Absolute advantage – a theory stating that countries should specialize in the goods or services they are able to produce more efficiently than other nations, while trading for other goods or services that they produce less efficiently.

Accounting profits – any income in excess of a firm's explicit costs of production.

Aggregate demand total spending – comprised of consumption spending business investment, government spending, and the difference between the value of a country's exports and imports.

Aggregate supply total production – the total value of all goods and services produced in an economic system.

Automatic fiscal policy – changes in government spending or taxing that do not require new legislation or a government decision to act.

Barrier to trade – any condition that reduces the ability or incentive to import or export goods or services.

Barter – a system of exchange based on a unit other than money that is used to complete transactions.

Budget constraint – a graphic representation of alternative combinations of two products that could purchased with a given amount of money.

Business cycle – a term that is used to describe the ups and downs in economic activity.

Capital – any object that may be used to produce a good or service; the tools of production.

Capital gain – income that is the result of selling an asset for more than its purchase price.

Capital goods – products that are used to produce other goods or services but that are not capable of directly satisfying human wants.

Capitalism – an economic system in which the factors of production are owned and controlled by people.

Cartel – a group of similar producers that cooperate with each other, usually to maintain artificially high prices by jointly restricting supply.

Ceteris paribus – A phrase that means "all else remaining equal or unchanged."

Circular flow chart – A representation of a mixed capitalist economic system, showing the flows of goods and services and of resources (in a clockwise direction) and the flow of many (in a counter clockwise direction) through the product and factor markets.

Classical economic theory – an economic theory asserting that competitive free. market economies are self regulating.

Coefficient of elasticity – The ratio between a percentage change in one factor and the resulting percentage change in some other condition.

Command economy – an economic system that relies on a central authority to own most resources and to make the three central economic decisions.

Common stock – a unit of ownership in a corporation that gives its owner a voice in making important business decisions and a right to share in the firm's profit after the firm's other financial responsibilities have been met.

Communism – An economic and political system that combines government ownership and control of the factors of production with a totalitarian form of government.

Comparative advantage – a special ability to produce a good or service at a lower relative cost than others can produce it.

Competition – a situation in which many producers offer the same good or service for sale to many consumers.

Complementary goods – related goods that must be used together; an increase in the price of one will cause a decrease in the quantity demanded of the other, even if its price remains the same.

Consumer goods and services – goods and services that are capable of directly satisfying human wants.

Corporation – a business organization that is owned by many people but is considered a single legal entity.

Cost – an expense that is paid.

Cost-push inflation – the inflation that occurs when the quantity of products being supplied at the current price level declines because of an increase in the cost of production.

Currency – paper money and coins provided by a government .

Default failure – failure to pay on time, either the interest or the principal on a bond.

Demand – the quantity of a product that consumers will purchase at each possible price.

Demand curve – a graph indicating the product quantities that will be demanded at different possible prices.

Demand-pull inflation – the inflation that occurs when the quantity of products demanded at the current price level exceeds the quantity supplied.

Demand schedule – a table indicating the product quantities that will be demanded at different possible prices.

Depreciation – a decline in an asset's value that occurs as a result of time or use; a decrease in the value of a currency in relation to other types of currency in a floating exchange rate system.

Determinants of demand – factors that cause people to demand different quantities of a product even if its price remains the same.

Determinants of supply – factors that cause firms to supply different quantities of a product even if its price remains the same.

Differentiate – to convince consumers that a product is significantly better in some way than other similar goods or services.

Diminishing marginal productivity – the relationship between employment and production in which each additional worker hired in the short run results in a smaller amount of additional production.

Diminishing marginal utility – a principle stating that additional units of a product have less value than preceding units of that product.

Discretionary fiscal policy – changes in government spending or taxing that are the result of new legislation or the result of a government decision to act.

Disposable income – the actual money income that households have available to spend after personal taxes are paid.

Dividend – a share of a corporation's profits that is paid to its stockholders.

Division of labor – dividing the job of producing a particular product into many individual tasks and training different people to complete each task.

Easy money policy – a banking policy to lend money to all qualified borrowers, usually at relatively low interest rates.

Economic fluctuation – a term used to describe the ups and downs in economic activities.

Economic profit – any income in excess of a normal profit.

Economics – the study of how we use scarce resources to produce goods and services to satisfy our wants.

Economic system – a set of rules or understandings that governs how scarce resources are used to produce goods and services that satisfy human wants.

Elasticity – the measurement of a cause-and-effect relationship.

Entrepreneurship – the ability to organize land, labor, and capital to produce goods and services.

Equation of exchange – a formula that relates changes in the amount of money in circulation to changes in prices; MV=PQ.

Equilibrium – level of total income the amount of total income resulting in an aggregate demand that is exactly equal to the aggregate supply.

Equilibrium price – a price at which the quantity of a product demanded is the same as the quantity businesses are willing to supply.

Expenditure approach – a way of measuring the value of the GDP based on the idea that the value of all the expenditures of money that are made to purchase all final goods and services produced in the economy must have the same value as the GDP.

Explicit cost – the total amount a firm spends to produce or acquire the goods or services it offers for sale.

Factor inputs – are inputs of production which constitutes the factors of production: Land, labor, capital and entreprenurship.

Final goods – goods that have been completed and are ready to be sold to their final consumers.

Fiscal policy – an attempt by the government to affect the economy through its taxing and spending.

Fixed costs (FC) – costs that must be paid regardless of how many products a firm produces or offers for sale.

Floating exchange rate – the value of currencies relative to other currencies, as set by international financial institutions according to the demand and supply for each currency.

Four factors of production – the resources necessary to the production of goods or services: land, labor, capital, and entrepreneurship.

Franchise – the purchased right to organize and operate a business under an established trade name.

Free enterprise – a system in which people are free to start businesses and decide how resources will be used to produce goods and services of their choice.

Free trade association – an organization of countries that lowers or eliminates barriers to trade within the group but that maintains barriers to nonmember nations.

Frictional unemployment – term describing the situation of people who have recently started to look for work or who are temporarily between jobs; short-term unemployment.

Functional distribution of income – the relationship between people's income and production suggesting that a certain distribution of income will result in the greatest total production.

General Agreement on Trade and Tariffs (GATT) – an international agreement intended to set rules for how international trade is carried out.

Good – a tangible object that is capable of satisfying human wants.

Gross Domestic Product (GDP) – the most common measure of an economy's production; the current market value of all final goods and services produced in an economy for a specific period of time (typically one year), using factors of production located within the country.

Imperfect competition – a market condition in which firms operate with some degree of monopoly-like power; a condition between perfect monopoly and perfect competition.

Income approach – a way of measuring the value of GDP that counts all payments received by economic participants for the production or sale of all final goods and services produced in the economy.

Indifference curve – a graph showing different combinations of two products that provide the same amount of total utility to a person.

Inferior good – a product of relatively low quality; demand for inferior goods is negatively related to disposable income.

Inflation – a sustained increase in the average price level.

Inflationary gap – an equilibrium level of total income at which spending creates more jobs than there are people who want to work.

Infrastructure – the permanent installations, such as roads, sewers, and water systems, that make up the foundation of a city.

Intermediate goods – goods that are in-process or raw materials that are in some stage of production.

International Monitory Fund (IMF) – an organization that uses money provided by member nations to make loans to developing nations.

Labor – human effort used to produce something of value.

Law of demand – a law stating that, all else remaining equal, more of a product will be demanded at a lower price than at a higher price and that less of a product will be demanded at a higher price than at a lower price.

Land – natural resources before they are changed by human effort.

Law of increasing costs – a law stating that, as a firm makes more units of product, it will eventually reach a point where the per-unit cost of producing the additional products is greater than the per-unit cost of producing the preceding products.

Law of supply – a law stating that, all else remaining equal, more of a product will be supplied at a higher price than at a lower price, and that less of a product will be supplied at a lower price than at a higher price.

Liquid capital – a term sometimes used to describe money.

Long run – a period of time that is long enough for a firm to change the size of its physical plant.

Average cost curve — a line showing the average total costs and marginal costs associated with the different sizes of physical plants a firm could build.

Lorenz curve – a graphic demonstration of a nation's distribution of income among family groups.

Macroeconomics – the study of economics from a global or overall point of view.

Marginal cost (MC) – the additional cost of making one more product at any level of production.

Marginal factor cost – the cost of adding an additional resource to production, such as the wage of an additional worker.

Marginal physical product (MPP) – the change in total physical product that results from adding an additional resource, such as an additional worker.

Marginal propensity to consume (MPC) – the average share of each monetary unit (for example, one Birr) of disposable income that people choose to spend.

Marginal propensity to save (MPS) – the average share of each monetary unit (for example, one Birr) of disposable income that people choose to save.

Marginal revenue product (MRP) – the change in a firm's total revenue that results from adding an additional resource, such as an additional worker.

Marginal revenue – the change in total revenue that results from selling one more product unit.

Marginal tax rate – the share of the next monetary unit (for example, one Birr) that a person receives that will be taken by the government in taxes.

Marginal utility – the value of the next unit of a product; the amount a person is willing to pay fur the next unit of a product.

Market – the transactions that take place between all buyers and sellers of a specific good or service.

Medium of exchange – a term describing the function of money, when people are willing to accept money as having value, to carry out transactions.

Megalopolis – an area of urbanization that includes many cities and suburban areas blended into each other with little to distinguish one part from another except arbitrary boundaries created by governmental units.

Microeconomics – the study of economics from the point of view of individual businesses or people.

Mixed capitalism – an economic system that is similar to capitalism but has some characteristics of other economic systems.

Model – a representation of reality used to help people understand relationships and predict the future.

Monetory policy – the attempt of the federal reserve system to stabilize the economy by affecting the amount of money in circulation and its speed of circulation.

Money – anything that functions as a medium of exchange; a unit of account; and a store of value.

Money supply – the quantity of money available to be spent at a given time.

Monopolistic competition – a market condition in which many firms produce similar products that are distinguished from one another, often through advertising.

Monopoly – a condition in which a firm is the only producer of a product that has no substitutes; a firm that has a monopoly.

National income – the income received from all purchases of factors of production; the value of the GDP minus the values of depreciation, net income earned abroad, and indirect business taxes.

Negative balance of trade – the situation resulting when the value of a nation's imports exceeds the value of its exports.

Net domestic product (NDP) – the value of the GDP minus depreciation.

Net exports – the difference between the total value of a nation's exports and the total value of its imports.

Net investment – the value of gross private domestic investment minus depreciation.

Non-factor inputs – are inputs of production out of the factors of production.

Oligopoly – a market condition in which a few firms dominate production of a particular type of good or service and have a substantial degree of interdependence.

Opportunity cost – the value of the second-best choice that is given up when a first choice is taken.

Partnership – a business organization that is owned by two or more individuals under a contractual agreement.

Patent – a document registering a new product or process with the government, making it illegal for others to use this product or process for a specified period of time, usually 17 years.

Personal income-the amount of income that a person receives due to her or his own productivity and from other sources.

Point of equilibrium – the point where a product's demand and supply curves meet, which indicates the product's equilibrium price.

Positive balance of trade – the situation resulting when the value of a nation's exports exceed the value of its imports.

Price-elastic demand – the type of demand that exists when a change in a product's price results in a larger relative change in the quantity that is sold.

Price-elastic demand – the relationship between a change in price and the resulting change in the quantity of a product that is sold.

Price-inelastic demand – the type of demand that exists when a change in a product's price results in a smaller relative change in the quantity that is sold.

Prime interest rate – the rate of interest charged by banks to large business customers.

Producer price index (PPI) – a measure of inflation similar to the CPI except that it is based on the cost of roughly 2,500 resources typically purchased by businesses in the factor market.

Production – the creation of goods or services.

Profit – what results when a firm's revenues are greater than its costs.

Progressive tax – a tax that takes a larger share of a person's income as his or her earnings grow.

Proportional tax – a tax that takes the same percentage of all people's income.

Protective tariff – a tax on an imported good or service that is primarily intended to protect a nation's businesses from foreign competition.

Public good – a government-provided product that is available to all members of a community on an equal basis.

Quota – a limit on the quantity of a product that may be imported into a country.

Real GDP – the value of the GDP adjusted for a change in price, expressed in constant dollar.

Recession – a period of time when the level of economic activity is lower than the average trend over time.

Regressive tax – a tax that takes a smaller share of a person's income as his or her earnings grow.

Revenue – income received.

Revenue tariff – a tax on an imported good or service that is primarily intended to generate income for a nation's government.

Scarcity – a condition in which it is impossible to satisfy all human wants for goods and services; the central concept in economics.

Service – an intangible action that is capable of satisfying human wants.

Short run – a period of time that is not long enough for a firm to change the size of its physical plant.

Specialization – concentrating labor on a particular task to increase productive efficiency.

Stagflation – an economic state in which production is stagnant or falling and prices are increasing.

Structural unemployment – layoffs of workers because they lack required skills for employment.

Substitute goods – related goods that may be used interchangeably; an increase in the price of one will cause an increase in the quantity demanded of the other, even if its price remains the same.

Supply – the quantity of a good or service that firms will offer for sale at each possible price.

Supply curve – a graph indicting the product quantities that will be supplied at different possible prices.

Supply schedule – a table indicating the product quantities that will be supplied at different possible prices.

Tariff – a tax on an imported good or service that increases the price consumers must pay for those imported products, and that therefore discourages their sales.

Tastes and preferences – personal feelings toward the value or desirability of various products.

Three central economic questions – the basic decisions that must be made in all economic systems; what goods and services should be produced, how these goods and services should be produced, and for whom these goods and services should be produced.

Time lag – the time it takes government to form and implement economic policy.

Total cost (TC) – the sum of a firm's fixed and variable costs.

Total physical product (TPP) – the total quantity of products a firm is able to produce from a given quantity of resources.

Total revenue – the amount of income a firm generates from its sales; price times quantity sold.

Total utility – the utility that is derived by a person from all the units of a particular product that he or she owns.

Trade-off – the act of choosing one alternative at the expense of another.

Transfer payments – payments of money by the government to people for social reasons rather than as compensation for labour or products.

Unemployed – a term describing workers who are over 16, are not institutionalize, and have actively looked for work but are not able to find employment.

Unit-elastic demand – the type of demand that exists when a change in the price of a product results in an equal relative change in the quantity sold.

Utility – a measure of the value of a good or service.

Value-added tax – a tax on the additional value that firms add to the products they produce.

Variable costs (VC) – costs that change with the number of products a firm makes or offers for sale.

Velocity – the speed at which money circulates through the economy.

Yield – the percentage of return a financial instrument pays on its price.

© MoE, FDR Ethiopia
Not to be republished