

ENGINEERING
ECONOMICS & ACCOUNTANCY

Dr. Jagat Jyoti Barua & Rishi Bhargav Das

ENGINEERING

ECONOMICS & ACCOUNTANCY

*As per the latest syllabus issued by
Directorate of Technical Education*

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PREFACE

ENGINEERING

ECONOMICS & ACCOUNTANCY

This book on **Engineering Economics & Accountancy** is a modest endeavour to provide a comprehensive textbook for the students. This textbook has been prepared in strict adherence to the latest syllabus issued by the Directorate of Technical Education. Engineering Economics is an essential domain of Economics wherein principles and theories are applied in the decision making process and in the selection of best option among the technically efficient methods of production used in the arena of engineering. We are highly indebted to the great works of the economists whose ideas and notions have been used with proper referencing and citation in developing this textbook.

We take this opportunity to express our heartfelt regard, affection and gratitude to our family, friends, colleagues and the publisher for always encouraging us in this effort.

We shall be grateful to the readers for their valuable suggestions for improving this book in the next editions. Please send the suggestions at jagatjyotibarua@gmail.com.

Dr. Jagat Jyoti Barua
Rishi Bhargav Das

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Chapter 1

Introduction to Economics

In our entire journey from womb to tomb we are surrounded by different aspects directly or indirectly related to the realm of Economics. A person from any walk of life whether he/she is an engineer, a technician, a doctor, a technocrat, a politician, a defence personnel, a civil servant, a businessman, a professional, an academician, a student, a housewife or a priest feels the need to understand the economic phenomenon around him. Furthermore, any idea like building a house, interlinking of rivers or a mission to mars all these ideas have economic implications on an individual or the society as a whole.

It is believed that the term 'Economics' owes its origin from a Greek word "Okionomia" which means "household management". In course of time, the word evolved and brought into its ambit the society and its needs and preferences.

There are different schools of thought in Economics. It is very rare to find unanimity among the thinkers and economists in their endeavour to define the term "Economics". The perceptions of Western thinkers, and the American thinkers have profoundly influenced the discipline of Economics. Ancient Indian economic thought represented by the works of Chanakya in Arthashastra do not have a significant mark in the global discussions on Economics.

1.1. Definitions of the term 'Economics'

The gist of an economic theory revolves around the laws and principles which rule the functioning of the various components of an economic system.

An economy confronts the problem of tackling unlimited wants of the members of the society. At the same time, the productive resources that are available to satisfy the unlimited wants of the society are limited. Hence, there is a need of a system to decide how to allocate and use these scarce resources to obtain the maximum possible satisfaction of the members of the society. To sum up, Economics studies the techniques applied by people to organise themselves to tackle the basic problem of scarcity.

Besides, Economics is time and again referred as the social science that studies economic activities. This definition is, however, too wide. It does not specify the exact manner in which the economic activities are to be studied. Economic activities essentially mean production, exchange and consumption of goods and services. However, with the growth of the society, the complexity of the production, exchange and consumption processes in society have increased manifold. Economists at different times have highlighted different aspects of economic activities, and have arrived at different definitions of Economics. It would be prudent on our part to discuss some of the important definitions.

Chapter 2 | Demand and Supply

2.1. Meaning of Demand:

In economics, the twin forces of 'Demand' and 'Supply' play a very vital role. They are the basic forces around which almost all the economic phenomena revolve. It will be worthwhile to understand the meaning of the terms 'Demand' and 'Supply'.

In our earlier discussion in chapter 1, we observed that in common parlance the terms desire, want and demand are used alternatively. In realm of economics, they are not same. Desire represents merely a wish to have a commodity. Desire is simply craving for a commodity. Anyone can desire anything, irrespective of availability of the commodity and the affordability to get that commodity.

Want is the desire backed by ability and willingness to pay. A desire becomes a want only when the consumer is in a position to purchase it.

Demand for a commodity means the desire for the commodity backed by purchasing power and the willingness to spend. When a consumer wishes to consume a commodity and also has the necessary purchasing power, the consumer is said to have demand for the commodity.

Thus, Demand for a commodity is the quantity of a commodity that a consumer is willing to buy at a given price during a given period of time.

N. Gregory Mankiw¹ states, "The quantity demanded of any good is the amount of the good that buyers are willing and able to purchase."

Frederic Benham² "The demand for anything, at a given price, is the amount of it which will be bought per unit of time at that price. Demand means always demand at price; the term has no significance unless a price is stated or implied."

According to A. Koutsoyiannis³, "Demand is a multivariate relationship, that is, it is determined by many factors simultaneously. Some of the most important determinants of the market demand for a particular product are its own price, consumers' income, prices of other commodities, consumers' tastes, income distribution, total population, consumers' wealth, credit availability, government policy, past levels of demand, and past levels of income."

¹ Mankiw, N. G. (2007). *Principles of microeconomics*, South-Western Cengage Learning, p67

² Benham, F. (1938). *Economics: A general textbook for students*, Sir ISAAC Pitman and Sons. LTD., London p36

³ Koutsoyiannis, A. (1988). A. (1979), *Modern Microeconomics*. p13

Chapter 3 | Production

3.1 Meaning of Production

In this section we would endeavour to understand the meaning of production and the factors associated with the process of production. For a layman, production is the process by which the raw materials or inputs are converted into output or finished goods for consumption. It is thus the creation of a thing. The process of production involves four vital agents or factors that assist the process of production. The factors of production are land, labour, capital and the entrepreneur. The entrepreneur has a vision of producing something and therefore garners and collects the other factors viz., land, labour and arranges the capital. The entrepreneur brings all the factors of production into a single platform and gets the process of production initiated. The other factors of production may have been lying idle or may have been engaged in such other engagements earlier.

OECD¹ defines “Economic production is an activity carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods or services.”

Production relates to the process in which raw materials (inputs) are transformed into goods or services (outputs). The process of production involves various factors. The factors of production can be broadly classified into four viz., Land, Labour, Capital and Entrepreneur. In production the resources are used with the factors of production to create output that can be used for final consumption and further use as an input.

Production function is the functional relationship between factors of production (inputs) and the quantity of a good produced (output).

According to Koutsoyiannis, “The production function is purely a technical relation which connects factor inputs and output.”

The means, if we assume that there are three inputs, labour (L), Land (R) and capital (K) and the output (Q), the production function becomes,

$$Q = f(L, R, K)$$

3.1.1. The factors of production

As discussed, the process of production involves the factors of production. The vital factors of production are discussed below.

¹ <https://stats.oecd.org/glossary/detail.asp?ID=725>

Chapter 4 | Money

4.1 Meaning of Money

Money has profound influence in almost all the facets of human life. As we understand from our day to day experience money is one of the most liquid forms of instrument used for carrying out all economic transactions. It is the kingpin of almost all economic activities on this globe.

Before the advent of money, barter system existed as a medium of exchange in the economy. In the Barter system the different goods and commodities were directly exchanged for other goods and commodities. The Barter system had certain inherent demerits viz.

- (i) *Absence of double coincidence of wants*: If wants of two persons who intend to exchange goods do not coincide, the Barter system fails.
- (ii) *Absence of common measure of value*: In the Barter system, a lot of time is wasted in order to complete a transaction if a common measure of value does not exist.
- (iii) *Lack of divisibility of goods*: All goods cannot be divided or sub-divided. The barter system often fails when a big indivisible good is to be exchanged for a smaller good.
- (iv) *Difficulty of deferred payments*: The Barter system failed to provide a satisfactory mechanism for the contracts and transactions involving deferred payments.
- (v) *Issue of transportation*: As goods are involved in the Barter system, transportation of bulky goods is a serious impediment of the system.
- (vi) *Issue of storing wealth*: The Barter system failed to provide a convenient means by which wealth could be stored.

With the growth of human civilisation and increased expansion of production and trade and other economic activities, the limitations of the Barter system got exposed and consequently the quest for a convenient medium of exchange led to the discovery and evolution of money.

4.1.1. Evolution of the term 'Money'

To trace the origin of the word "Money" let us try to understand the etymology given in Online Etymology Dictionary¹. There are different views regarding the origin of the term money viz.,

¹ Online Etymology Dictionary Retrieved 16 November 2020 from <https://www.etymonline.com/search?q=money>

Chapter 5

Banking Organisations

5.1. Banking System

In this chapter, we shall endeavour to understand the banking system with special reference to Indian Banking system.

Banking system refers to a broad mechanism that encompasses the network of financial institutions and laws that render various financial services within an economy and across the globe.

The realm of banking system has evolved with the passage of time. According to Geoffrey Crowther (1940), the present day banker has three ancestors viz., the merchant, money lender and the goldsmith.

Every bank has a very great deal of the money-lender in its composition. It collects money from those who have it to spare or who are saving it out of their income, and it lends this money out to those who require it.¹

The banking system encompasses the central bank of respective countries, commercial banks and specialized banks viz., investment banks, merchant banks etc. Normally banks accept deposits as well as savings from general public, business firms, other governmental and non-governmental institutions, corporate houses and etc. On the other hand, banks provide credit facilities and loans to various borrowers; and deals with government securities and corporate investments. Besides, banks enable money transmission in the economy and render an array of financial services to its customers of various categories.

Thus, banking system is an essential portion of the entire financial system of the economy.

Now, let us try to understand the concept of the central bank with specific reference to the Indian banking system.

5.1.1 Central Bank:

The central bank in most of the economies is the apex monetary institution and holds the supreme authority in the arena of monetary policy and banking structure.

In modern economies, the central bank is usually responsible for the formulation of monetary policy and the regulation of member banks.

¹ G.Crowther: An Outline of Money, 1941, pp. 39.

Chapter 6 | Market

6.1 Meaning of Market

In this chapter we would endeavour to understand the meaning of market and classification of market into various types. As discussed in the preface there certain limitations while taking up our discussion on certain topics. The syllabus restricts us from having a detailed discussion on the concepts of cost and revenue. Keeping in view the limitations we in this chapter would discuss the various types of markets but refrain from taking up the discussion on determination of price and output in these various forms of markets.

In common parlance, the term "market" identifies itself with a place that facilitates sellers and buyers of a commodity, good or service to interact in order to facilitate an exchange. In order to visualise the meaning of the term in wider context, we may understand Market as a medium, system, institution, infrastructure that facilitates trade of a product or service.

In the present modern era, the notion of market has widened. The physical presence of sellers and buyers is not necessary in the market as because the interactions and transactions can be carried out over telephone, over internet. Thus, the market for a product or a service could include the whole region where sellers and buyers of that product or service are spread. It does not refer only to a fixed location.

In a nutshell, Market is a medium, mechanism or institution which enables exchange of goods and services that takes place as a result of direct or indirect interaction of sellers and buyers.

A market depends on the decision taken by the buyers and sellers regarding the production of goods and services and resources. The decisions made by either side determine the price of the goods and services available in the market. Very often economists use the concepts of demand and supply. Supply and demand determines the quantity of each good or service produced and the price at which it is sold. The market consists of a group of sellers and buyers of a particular good or service. The buyers determine demand and sellers determine supply. Market thus refers to the entire area of operation of demand and supply. The French economist, Antoine Augustin Cournot also opined market to be a whole of any region where buyers and sellers freely interact.

Before we start classifying markets into different types based on standard parameters, let us explore the variety of forms in which the market manifests. Market has manifold manifestations. The market varies based on type of good and service, participants, form, scale, volume, location. A non-exhaustive list include physical consumer market, food retail market, wholesale market, shopping malls, supermarket, hypermarket, Ad hoc auction market, Used goods market, weekly fairs, physical business market, labour market, media markets, Internet markets.