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## UNIT 3 METHODS OF ECONOMIC ANALYSIS

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### 3.0 OBJECTIVES

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After going through this unit, you will be able to explain :

- 1 difference between partial and general equilibrium approaches;
- 1 the difference between static and dynamic methods of analyses;
- 1 the difference (if any) between an economic theory and an economic law;
- 1 the difference between a stock variable and a flow variable and
- 1 the art of constructing economic theory by using the principles of scientific method of enquiry.

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### 3.1 INTRODUCTION

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Continuing with the discussion on methodology of economic analysis, we, in this *unit go through the discourse on the distinction between partial and general equilibrium analysis. The focus of partial approach is on single market in isolation, while in the general equilibrium approach it is on simultaneous working of all markets in an economy in an interwoven manner.* An economist has to take recourse to both the methods depending on the types of problems and issues that are to be analysed. As we proceed in the text we will have more to say on this subject. On the question of methodology itself, an economic analyst would also like to make a distinction between static and dynamic methods of analysis. Like partial equilibrium approach, the static method is easier to handle than dynamic analysis. We will complete our discussion on methodology by describing how economic theories are constructed and verified. Remember that we described economics as a science in Unit 10. Here, a scientific method of enquiry will be used to construct and verify an economic theory. Subsequently, we will explain the difference between a theory and a law. Are economic laws immutable? I can be pointed out that the purpose of constructing a theory is both to provide an explanation of the phenomenon that is under study and to using it for making predictions of events which have not yet occurred in the economy. The discussion in this unit is closed by describing the difference between a stock variable and a flow variable. Most of the variables we deal with in Micro and Macroeconomics are flow variables. However, market exists for flow as well as stock variables.

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## 3.2 PARTIAL VERSUS GENERAL EQUILIBRIUM ANALYSIS

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In partial equilibrium analysis, we concentrate on a single market, in isolation from the rest of the economy. We analyse in detail a particular market or a set of markets neglecting everything else. For instance, when we want to study the market for wheat in detail, we do not bother about other markets in the economy. Such an analysis is based on *ceteris paribus* assumption. Demand and supply models of price determination of a good is based on partial equilibrium analysis. It ignores various linkages and inter-relationships that might exist between different markets. On the other hand, in general equilibrium analysis we analyse simultaneously all the markets in the economy. The basic premise in such an analysis is that, “everything depends on everything else”. *All the markets of the economy are interdependent and interrelated so that a disturbance originating from any one market will have repercussions throughout the economy.* In such a situation general equilibrium analysis is the correct approach for analysing the functioning of the economy. In fact, partial and general equilibrium analyses are two ways of looking at the functioning of the economy.

Partial equilibrium analysis is appropriate when we want to analyse in detail the functioning of a particular market or a particular sector of the economy. It is used when a market is self-contained or insulated from other markets or when the market in question is relatively small, relative to the size of the economy, or when the cross-effects generated by this particular market are negligible and hence can be ignored. Partial equilibrium analysis makes the analysis of a problem more manageable, unlike general equilibrium analysis which is often difficult to comprehend. Reality is so complex that one needs a process of simplification (abstraction) to understand it. Partial approach is one such form of simplification, where each market is viewed in isolation. Partial equilibrium analysis was championed by Alfred Marshall (1890) and is based on “*ceteris paribus*” assumption. Such an assumption abstracts from all interconnections and inter-links that exist between the market under study and the rest of the economy. For instance, we use demand-supply model to show how equilibrium price and quantity is determined in each market, independently of other markets. However, we know very well that a change originating from any market has spillover (repercussions) effects on other markets. When these changes in other markets (sectors or industries) are significant, the partial equilibrium analysis is inappropriate and inadequate. By taking into account only the direct effect on price and quantity, partial equilibrium approach, “provides a misleading measure of the total, final effect, after all the repercussions or feedback effects from the original change have occurred.” If and only if the market or the sector (industry) from which the original change occurs is relatively small and has very few linkages with the rest of the economy, the partial equilibrium analysis would be the right approach to study the operation of market system. Otherwise a general equilibrium approach is needed.

When market (economic) interdependencies or interrelationships are not taken into account, or do not exist, partial equilibrium analysis is the correct approach. However, when such interrelationships and interdependencies exist and are important, and the ignorance of which will have serious consequences or will prove costly in terms of the quality of economic predictions, a general equilibrium analysis must be used. It must be used whenever an event has all pervading effect.

### Check Your Progress 1

- 1) If you want to study in details the working of the market for milk in your city, which methodology will you use?
- 2) As demand for automobiles goes up, the demand for steel goes up, which in turn

increases the demand for aluminum and so on. Is this an example of partial equilibrium approach or general equilibrium approach ?

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### 3.3 STATIC VERSUS DYNAMIC METHOD OF ANALYSIS

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Economic analysis can be conducted either by using a static framework or a dynamic setting. Static and dynamic modes of analysis can be differentiated in more than one ways. According to one definition, in a static model (theory) the variables (cause-effect) are not dated. The demand-supply model of market behaviour is a static model. The model that demand depends on own price, supply depends on own price, with an equilibrium condition that demand must equal supply, time does not enter into the picture at all and the variables are all undated. According to this definition, a dynamic model would be one where the relevant variables are dated. If the demand-supply model is restructured as follows, then the model would become dynamic according to this criterion.

$$D_t = f(P_t)$$

$$S_t = g(P_t)$$

$$D_t = S_t$$

where 't' is the relevant time unit.

However, according to some economists, even if the variables are dated the model does not become dynamic. A dynamic model according to this definition would be one where the variables must be dated and a time lag must exist in their relationships. According to this criterion the following would be a dynamic model.

$$D_t = f(P_t)$$

$$S_t = g(P_{t-1})$$

$$D_t = S_t$$

There is **no lag** in the demand relationship. Demand in period 't' depends on own price of the same period. However, in the supply relationship a gestation lag exists which makes the model dynamic. Supply in period 't' depends on price prevailing in the previous period (t-1). The price level in previous period (t-1) would have induced the producers to increase or decrease the supply, full impact of such decisions are visible in time period 't' only. For market to attain equilibrium, demand in period 't' must equal supply in period 't'.

It must be noted that if one is concerned with the equilibrium configurations of a market for a good, one has to take recourse to a static methodology. *Equilibrium is a static concept*. It describes the position of a market at rest. In contrast, disequilibrium analysis must pertain to dynamics. It brings into focus the market adjustment process (or, market corrective process), the interplay of which would move the market back to equilibrium. One has to analyse how the market moves through time during the period the adjustment process is working. In a static framework, we implicitly assume that market adjustment is instantaneous, and without any loss of time, equilibrium is or is not restored. How the economic agent behaves in the disequilibrium situation is not the concern of static analysis. This is where dynamic analysis sets in. It must be noted that in a static framework one might be interested in comparing (or evaluating) two or more equilibrium positions before and after a change in some exogenous forces. Such a method is known as **comparative static**. For instance, consider analysing the

effect on price of cars when demand increases. We concentrate on two equilibrium positions, one before change and another after the change in demand has taken place. What happens in the interim period is not the concern of static analysis.

### Check Your Progress 2

1) Consider the following demand/supply functions

A) i)  $Q_x^D = a - bP_x$  ;

ii)  $Q_t^S = f(P_t)$  ;

B) i)  $Q_x^D = A - BP_x$

ii)  $Q_t^S = f(P_{t-1})$ .

Are these models Static or Dynamic ?

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## 3.4 CONSTRUCTION AND VERIFICATION OF ECONOMIC THEORIES

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Construction of economic theory consists of the following stages:

- 1) We choose a hypothesis or a proposition about the phenomenon or events we are interested in investigating. This is derived from the empirical observation of the phenomenon under study. For instance, we choose as a hypothesis the inverse relationship between the quantity demanded for tea and the market price of tea. This hypothesis is thrown up by market observations (or data).
- 2) At the next step, we formulate an economic model (which is our theory) about the causal relationship among the relevant variables embedded in the hypothesis. The method of *deductive reasoning* is used to develop such a cause-effect relationship. It deals with an 'if-then' kind of argument in terms of why such a relationship exists. To develop such a model or theory a process of abstraction has to be applied. Since reality is infinitely complex, to make any headway in explaining a phenomenon simplification process has to be used. In other words, the inessentials are discarded while the essentials are incorporated into the model. Such type of simplification is required in order to keep the model manageable. One such model is the cardinal utility theory of demand.
- 3) Next, the model is applied to the hypothesis or the proposition to derive the implications or the conclusion as regards the phenomenon under study. For instance, when we use *the cardinal utility theory of demand*, we find that when a consumer consumes larger quantity of a good, the marginal utility tends to fall. Hence, unless the price is lowered, larger quantity will not be consumed (since the theory would postulate that price reflects marginal utility). Thus, the conclusion that when price is lowered a larger quantity is demanded (which is our hypothesis to start with).
- 4) The last step relates to conclusion derived from the model is put to empirical testing. In other words, the conclusion regarding the phenomenon or the object under study is set against or confronted with the observations on the phenomenon or object as it is found in reality. In order to test empirically the conclusion of a theory we have to take recourse to statistical or econometric methods to scan the empirical data for relationship it is trying to establish. If such a testing confirms the relationships established by our model, then we accept the theory as providing a logically valid explanation for the phenomenon or objects as observed in reality. However, if empirical testing contradicts our conclusions about the object under study then either we discard the theory altogether or modify the hypothesis (going

back to the first step and starting the enquiry process once again) as well as the model. This process of going back and forth from hypothesis to empirical observation and testing is repeated till it is possible to find a hypothesis which agrees with observations on the phenomenon as they are found in reality.

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### 3.5 ECONOMIC THEORY AND ECONOMIC LAWS

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A model is one, which is used to describe a set of causal relations among economic variables or economic objects. *A hypothesis, which is successfully tested, is called a theory. The purpose of a theory is to explain and predict.*

*An economic theory, which is true under similar set of circumstances, is called a law.* For instance, the Law of Demand.

#### Check Your Progress 3

Consider the statements:

- i) Consumption depends on income
- ii) Population rises when per capita income goes up .

Which of the above statement is a theory or a law?

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### 3.6 STOCK VARIABLE AND FLOW VARIABLE

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In economics we deal with two types of variables, *flow variables* and *stock variables*. Anything, which varies, is a variable, (For instance price, quantity demanded and supplied, income, investment, exports, imports, employment, cost of production, profits etc.). However, for variation to be observed we will have to specify the period of time. Whether it is a week, a month, or a year or a longer period of time. Now in each of these periods the relevant variable may be a stock variable or a flow variable. *Both stocks and flows are expressed at a precise moment in time. However, a flow variable has both a time dimension and a time reference, while a stock variable has only a time reference. Though both are measured at fixed points in time, flow variables are measured in “temporally determined units”. In other words, flows are always expressed per unit of time. While stocks are always expressed at a point in time.* For instance, capital is a stock variable, since it has no time dimension but has only time reference, like stock of capital on 1st January 2000. Investment, however, is a flow variable since it is expressed per unit of time, like 10 per cent per annum. *Wealth is a stock magnitude while income is a flow magnitude.* Stocks and flows are related to each other in the sense that differences in stocks in the two periods (say 1-1-2000 and 31-12-2000) will constitute flows during the period (the time interval 1-1-2000 to 31-12-2000). It is through flows that stocks are added (to, or depleted). For instance, capital stock on 1-1-2000 plus the net flows of investment ( net of depreciation )during the period 1-1-2000 to 31-12-2000 will make the stock of capital on 31-12-2000. The importance of stocks and flows is that there exists markets for both stocks and flows. In micro-economic theory we will be concerned more with flows than with stocks.

#### Check Your Progress 4

Identify the ‘stock’ and ‘flow’ among the following:

- i) Inflation rate, rate of interest, money supply, population
- ii) Demand for wheat and supply of wheat

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### 3.7 LET US SUM UP

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To recapitulate, in this unit we concentrated once again on methodological issues in economics. Essentially, microeconomic theory is based on partial equilibrium approach while macroeconomic theory is based on general equilibrium approach. The distinction between the partial and general equilibrium analysis has been spelt out in great details. Partial equilibrium analysis is based on *ceteris paribus* assumptions, while general equilibrium is characterised by “*everything depends on everything else*”. You must be often hearing the terms static and dynamic. We focussed on this distinction as well in this unit. In a very pedestrian manner we found that ‘*static*’ deals with timeless situation while ‘*dynamic*’ deals with changes over time. Equilibrium analysis is supposed to be static in nature while disequilibrium analysis pertains to dynamics. A description or the characterisation of equilibrium constitutes static framework.

We have concluded this unit with a discussion on how to construct and verify an economic theory. We have already tackled this question in the very first unit itself while expanding upon Lionel Robbins’ definition of economics. One uses the scientific method of deductive logic to construct economic theories. The conclusions derived from an economic theory must be tested empirically using the scientific method of econometrics. One cannot, however, be 100 per cent sure as to the success of such tests.

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### 3.8 SOME KEY WORDS

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- Dynamics** : When variables are dated. When changes take place over time.
- Economic Laws** : An economic theory, which is true under similar set of circumstances, is called a law.
- Economic Theory** : A model, which is used to describe a set of causal relations among economic variables or economic objects. A hypothesis, which is successfully tested, is called a theory. The purpose of a theory is to explain and predict.
- Flow** : A variable expressed per unit of time. It has both time dimension and time reference.
- General Equilibrium** : An equilibrium analysis where we analyse simultaneously all markets in the economy. All markets are considered to be inter-dependent and inter-related. It represents a more complex analytical framework than partial equilibrium analysis.
- Partial Equilibrium** : An equilibrium analysis pertaining to a particular market with everything else ignored. In particular, the interactions between various markets of the economy are not taken into account.
- Static** : When variables are not dated. Refers to ‘timeless’ situations.
- Stock** : Variable measured at a point of time. It has only a time reference.

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### 3.9 SOME USEFUL BOOKS

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Same as in Unit No. 1.

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## 3.10 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

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### Check Your Progress 1

- i) Partial equilibrium
- ii) General equilibrium analysis

### Check Your Progress 2

- 1) a) Static
- b) Dynamic

### Check Your Progress 3

- i) Statement of a theory
- ii) More of a law

### Check Your Progress 4

- i) flow, flow, stock, stock.
- ii) flow as well as stock.



# EEC-11

## Fundamentals of Economics

Block

# 1

## Introduction to Economics

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### UNIT 1

**Central Problems** **5**

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### UNIT 2

**Basic Economic Concepts** **16**

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### UNIT 3

**Methods of Economic Analysis** **30**

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# BLOCK 1 INTRODUCTION TO ECONOMICS

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This block introduces you to the subject matter of economics and underlying need for studying the economic problems. It has three units:

**Unit 1** deals with the nature, significance and definition of economics. **Unit 2** discusses the basic concepts used in economic analysis while **Unit 3** introduces the learners to methods available for analysing the economic problems. Employment of the techniques of partial and general equilibrium framework for quantification of the impact of independent variable(s) on a (or, set of) dependent variable(s) is the core methodology you will be introduced to.

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# INTRODUCTION TO ELECTIVE COURSE IN ECONOMICS EEC-11

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Economics is no longer the preserve of those who practiced statecraft and regarded it to be confined to the ways and means of raising finances to meet the “requirements” of the ruling elite. The discipline has moved from such confines to the domain of the common man. It is now concerned with our day-to-day decisions such as: Which commodities to produce? How to produce? Which techniques to use? Which factors or resources to use in which combinations to produce what quantity of a commodity? Not only this, it shows which consumer may gain access to what specific amounts of different goods? How to increase/decrease production of which good(s) in future? In other words, economics has moved away from financing the activities of state to helping the common man in the street to make many a crucial decisions impinging on their day-to-day life.

It must be remembered, however, that we have not moved from one extreme to another— from the state to the street. We, today incorporate a rather wide spectrum of activities in the domain of economics. These activities are: (a) consumers’ behaviour or choice process; (b) producers’ behaviour or how is the production organised and carried on, what is the special role of cost functions therein and also the different forms of market organisations; (c) different individuals co-operate in the process of production to contribute factors owned by them. How do we determine their ‘rewards’? Or, how do we distribute aggregate output among the members of society? (d) estimation of national (social) product and various aggregates, determination of level of income, employment and interest and also the relationship between money supply and prices; (e) some aspects of international trade; (f) public finance which not only incorporates all the aspects of meeting financial requirements of the state but also focuses on ‘newer’ aspects of collective decision making.

The present course, Fundamentals of Economics (EEC-11), aims at exposing the learner to each of the above aspects. The course is divided into 9 blocks, spanning over 21 units. Block 1 is concerned with introducing the subject matter of economics along with nature of basic economic concepts and the methodology of this discipline. Block 2 analyses the behaviour of the consumer while Block 3 is concerned with technical specifications of production and cost functions. Block 4 uses information and knowledge gained in previous two blocks and analyses behaviour of the producers under different forms of market organisation. The theories of factor pricing, that is, determination of wages, rent, interest and profits in the society is our concern in Block 5. These five blocks constitute core of micro economic analysis.

Next three Blocks deal with what is popularly known as macro-economic analysis. Block 6 explains the idea of circular flows of money (and goods and services) in the society, and measurement of national income. In Block 7, we present various aspects of determination of income, employment and interest in the society. This block is essentially based on J.M. Keynes’ contributions- though, at relevant points, we have also compared Keynesian ideas with ‘classical’ thinking about aggregative functioning of the society. In Block 8, we are introducing relationship between quantity of money and price level on the one hand and those between rate of change of prices and levels of unemployment on the other. In this context we discuss Classical, Keynesian and Modern versions of quantity theory of money and Philips curve.

Finally, Block 9 introduces you to the basic aspects of public finance, public goods, externalities and market failure, public revenue and expenditure and various concepts of deficit in the government budget. The other unit in this block examines comparative cost theory of international trade, gains from trade, terms of trade and the structure of balance of payments accounts.