

## **ECONOMIC & ECONOMETRIC MODEL:**

- Econometrics deals with the measurement of economic relationships.
- It is an integration of economics, mathematical economics and statistics with an objective to provide numerical values to the parameters of economic relationships.
- The relationships of economic theories are usually expressed in mathematical forms and combined with empirical economics.
- The econometrics methods are used to obtain the values of parameters which are essentially the coefficients of the mathematical form of the economic relationships.
- The statistical methods which help in explaining the economic phenomenon are adapted as econometric methods.
- The econometric relationships depict the random behaviour of economic relationships which are generally not considered in economics and mathematical formulations. It may be pointed out that the econometric methods can be used in other areas like engineering sciences, biological sciences, medical sciences, geosciences, agricultural sciences etc. In simple words, whenever there is a need of finding the stochastic relationship in mathematical format, the econometric methods and tools help.

The econometric tools are helpful in explaining the relationships among variables. Econometric Models:

- A model is a simplified representation of a real-world process.
- It should be representative in the sense that it should contain the salient features of the phenomena under study. In general, one of the objectives in modeling is to have a simple model to explain a complex phenomenon. Such an objective may sometimes lead to oversimplified model and sometimes the assumptions made are unrealistic. In practice generally, all the variables which the experimenter thinks are relevant to explain the phenomenon are included in the model. Rest of the variables are dumped in a basket called “disturbances” where the disturbances are random variables. This is the main difference between economic modeling and econometric modeling.

This is also the main difference between mathematical modeling and statistical modeling.

- The mathematical modeling is exact in nature, whereas the statistical modeling contains a stochastic term also.
- An economic model is a set of assumptions that describes the behaviour of an economy, or more generally, a phenomenon.

An econometric model consists of - a set of equations describing the behaviour. These equations are derived from the economic model and have two parts – observed variables and disturbances. - a statement about the errors in the observed values of variables. - a specification of the probability distribution of disturbances.

## **AIMS OF ECONOMETRICS:**

The three main aims econometrics are as follows:

1. Formulation and specification of econometric models: The economic models are formulated in an empirically testable form. Several econometric models can be derived from an economic model. Such models differ due to different choice of functional form, specification of the stochastic structure of the variables etc.

2. Estimation and testing of models: The models are estimated on the basis of the observed set of data and are tested for their suitability. This is the part of the statistical inference of the modelling. Various estimation procedures are used to know the numerical values of the unknown parameters of the model. Based on various formulations of statistical models, a suitable and appropriate model is selected.

3. Use of models: The obtained models are used for forecasting and policy formulation, which is an essential part in any policy decision. Such forecasts help the policymakers to judge the goodness of the fitted model and take necessary measures in order to re-adjust the relevant economic variables.

## METHODOLOGY OF ECONOMETRICS:

How do econometricians proceed in their analysis of an economic problem and what is their methodology? There are several schools of thought on econometric methodology. The **traditional** or **classical** methodology, still dominates empirical research in economics.

Broadly speaking, traditional econometric methodology proceeds along the following lines:

1. Statement of theory or hypothesis.
2. Specification of the mathematical model of the theory
3. Specification of the statistical, or econometric, model
4. Obtaining the data
5. Estimation of the parameters of the econometric model
6. Hypothesis testing
7. Forecasting or prediction
8. Using the model for control or policy purposes.

### 1. Statement of Theory or Hypothesis

Keynes stated:

The fundamental psychological law . . . is that men [women] are disposed, as a rule and on average, to increase their consumption as their income increases, but not as much as the increase in their income.

In short, Keynes postulated that the **marginal propensity to consume (MPC)**, the rate of change of consumption for a unit (say, a dollar) change in income, is greater than zero but less than 1.

### 2. Specification of the Mathematical Model of Consumption

Although Keynes postulated a positive relationship between consumption and income, he did not specify the precise form of the functional relationship between the two. For simplicity, a mathematical economist might suggest the following form of the Keynesian consumption function:

$$Y = \beta_1 + \beta_2 X \quad 0 < \beta_2 < 1 \quad \text{where} \quad (\text{I.3.1})$$

$Y$  = consumption expenditure and  $X$  = income, and where  $\beta_1$  and  $\beta_2$ , known as the **parameters** of the model, are, respectively, the **intercept** and **slope** coefficients.

The slope coefficient  $\beta_2$  measures the MPC. This equation, which states that consumption is early related to income, is an example of a mathematical model of the relationship between consumption and income that is called the **consumption function** in economics. A model is simply a set of mathematical equations.

If the model has only one equation, as in the preceding example, it is called a **single-equation model**, whereas if it has more than one equation, it is known as a **multiple-equation model**.