

✓ TWO-VARIABLE LINEAR REGRESSION MODEL (LRM)

The two-variable linear regression model used in economics is -

$$Y_t = a + BX_t \rightarrow \textcircled{1} \text{ (Mathematical Model)}$$

This is called an inexact linear relationship (or function) whereas the economic relationship is concerned. For example, because if we take the example of supply function which is generally determined by the price of the product, we see in actual practice that the supply is influenced not only by the price of the product but by some other factors also which may be incalculable. This incalculable factors can be included in the model by introducing a new variable called random variable or random term which is generally denoted by u_t or ϵ_t . Therefore, the exact relationship of the two variable to be used in economic analysis is given by

$$Y_t = a + BX_t + u_t \rightarrow \textcircled{2} \text{ (Econometric Model)}$$

REASONS FOR INTRODUCING RANDOM TERM OR RANDOM VARIABLE :

Following are the main reasons for introducing random terms -

① Variables Left Out: All the variables affecting the dependent variable might not be known or measurable or not important enough to be included in the model. Even if all the factors that can be introduced may be neither feasible nor desirable when the sample size is not very large enough since the degrees of freedom will be reduced. Therefore, we include the mean effect of all the variables left out (excluding the main explanatory variables) by introducing a r.v.

② Basic Unpredictability of Social Behaviour:

Human

behaviour - individual and social are unpredictable and irrational. This unpredictability arises because of the primary uncertainty in human behaviour. It can be treated as random factor characterised by insertion of a random disturbance.

③ Varying Behaviour among Individuals:

The eco.

behaviour of an individual varies due to varying propensities, size of family, climatic reasons etc. which are underestimated that these disturb the relationship between the variables in the model.

④ Errors of Observations and Measurement: The observations of the variable which are included in the model are not in general perfect, rather these are proxies against the actual variables propounded in a practical eco. theory.

SPECIFICATION OF THE MODEL:

In our model Y_t is dependent variable and X_t is independent or explanatory variable, U_t is random variable and α and β are parameters which are to be estimated or calculated. Mathematically, α is said 'intercept' of the regression model and β is called the slope i.e;

$$\beta = \frac{\partial Y_t}{\partial X_t} \left[\begin{array}{l} \text{Effect upon } Y_t \text{ in response to} \\ \text{the change in } X_t \text{ while other} \\ \text{variables are remaining unchanged} \end{array} \right]$$