[Frequently Asked Questions]

Others Functional Forms

Subject:	Business Economics
Course:	B. A. (Hons.), 3rd Semester, Undergraduate
Paper No. & Title:	Paper – 304 Basic Econometrics
Unit No. & Title:	Unit – 4 Others Functional Forms
Lecture No. & Title:	Lecture – 1 Others Functional Forms

Frequently Asked Questions

Q1. Why use logarithmic transformations of variables?

A1. Logarithmically transforming variables in a regression model is a very common way to handle situations where a non-linear relationship exists between the independent and dependent variables. Using the logarithm of one or more variables instead of the un-logged form makes the effective relationship non-linear, while still preserving the linear model.

Logarithmic transformations are also a convenient means of transforming a highly skewed variable into one that is more approximately normal. (In fact, there is a distribution called the log-normal distribution defined as a distribution whose logarithm is normally distributed – but whose untransformed scale is skewed.)

Q2. How to interpret regression coefficient in the model

A2. $\boldsymbol{Y = \beta_0 + \beta_1 X_1 + u}$

β_1 represents the expected change in Y in response to a 1-unit increase in X_1

Q3. How to interpret regression coefficient in the model

A3. $\boldsymbol{lnY = \beta_0 + \beta_1 X_1 + u}$

$100\,\beta_1$ represents the expected percentage change in Y in response to a 1-unit increase in X_1

Q4. How to interpret regression coefficient in the model

A4. $\boldsymbol{Y = \beta_0 + \beta_1 lnX_1 + u}$

$0.01\,\beta_1$ represents the expected change in Y in response to a 1% increase in X_1

Q5. How to interpret regression coefficient in the model

A5. $\boldsymbol{lnY = \beta_0 + \beta_1 lnX_1 + u}$

β_1 represents the expected percentage change in Y in response to a 1% increase in X_1

Q6. Is logarithmic transformation useful for skewed distribution?

A6. Logarithmic transformations are also a convenient means of transforming a highly skewed variable into one that is more approximately normal. (In fact, there is a distribution called the log-normal distribution defined as a distribution whose logarithm is normally distributed – but whose untransformed scale is skewed.)

Q7. Give linear model.

A7. $Y_i = b_0 + b_1 X_i$

Q8. Give Linear-log model.

A8. $Y_i = b_0 + b_1 log X_i$

Q9. Give Log-linear model.

A9. $log Y_i = b_0 + b_1 X_i$