

Applied Econometrics
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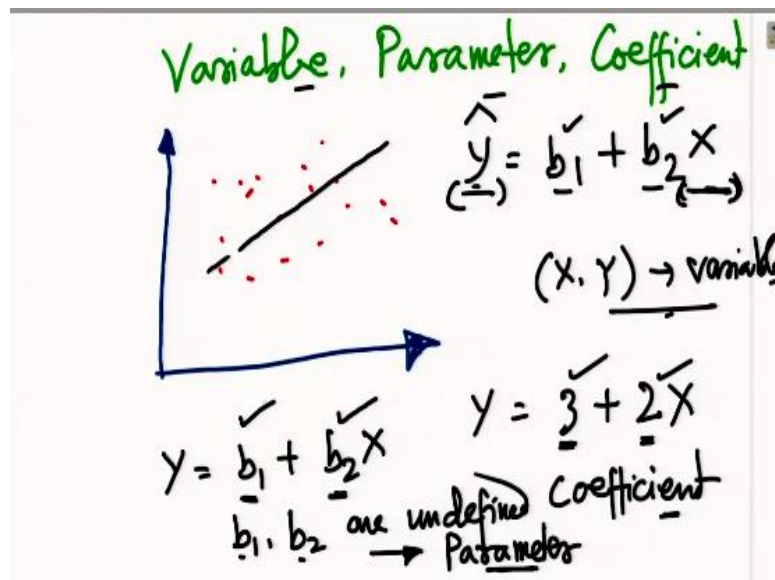
Lecture - 44

Definition : Variable, Parameter and Coefficient

Hello, and welcome back to the lecture on Applied Econometrics. We are discussing regression and in this lecture we are going to look at some of the definitions that often occur when we actually explain a regression equation. And we need to sort of be very particular about what definitions means what. And we will talk about three definitions in this lecture. One is variable and other is parameter and another is coefficient.

Now when I draw a regression line, if you remember, we actually have a scatter plot. Now using that scatter plot, we try to minimize the errors and we get a line. So let us say if I draw a regression line here, it will look like this.

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So let us say this is my, these are the different scatter point, points on the scatter plot and I draw a line that sort of minimizes the error, right. Now when I do that, I usually explain a regression equation like y equal to something like $b_1 + b_2 x$, okay. We can, when we are estimating a y we can write y as \hat{y} .

Now what is this b_1 what is this b_2 , what is x , what is y , and how sort of they are related to the definition variable, parameter and coefficient. So we will try to explain

that. Now when you are actually obtaining a regression equation, we will see that there are a set of variables we are measuring. So the set of variables here y and x . So these are the units that we are trying to measure.

So if I am changing x , what is the change in y , so this x and y , these constitute my variable. Now we have a β_1 or b_1 , β_2 . Sometimes we will find a regression equation where we write say, $y = 3 + 2x$ let us say. Now when I have these numerical terms defined, when I have this numerical terms defined, who are the multiplicative factor of the x , or which is the constant term in the equation, we call them as coefficient, we call them as coefficient.

Essentially, the coefficient we get once we actually determine the equation, when we actually get the values of β_1 and β_2 or b_1 and b_2 . So here b_1 is 3, b_2 is 2. So the moment we actually realize these values, and if you remember, when we spoke about the double structure variable, we actually want to realize the values. And when we realize the values, we actually call them as coefficient.

Whereas, when I write the equation as say, as in the previous manner $y = b_1 + b_2 x$, then my b_1 and b_2 are yet to be defined. So they are basically before you actually realize the regression equation. So you do not have a defined value for b_1 and b_2 . So b_1 , b_2 are undefined. So when my b_1 and b_2 are undefined, I call them parameter. So be very careful when you use this terms, parameter coefficient and variable.

So here my as long as my b_1 , b_2 are not defined, I call them parameter. But the moment that we define them, we call them coefficients, right. And the variables are the units that we actually measure, okay. So change in x and how the y is changing. So essentially what you have seen, so there are two, you know you can have a slope coefficient as I said, you can have a constant term here basically, which is the intercept.

Similarly, you can have a slope parameter here, b_2 and a parameter for your constant term, okay. So that is how we will define these three terms variable, parameter and coefficient.