

$E_{Y|X}[Y|X]$ is a random variable. This random variable takes values $E[Y|X=x]$. That is, for a given X draw, there is an expectation of Y given that draw of X . For instance, if X is employment status (employed/unemployed), and Y income, $E_{Y|X}[Y|X]$ is a random variable that takes two values: 1) expectation of income for an employed person, and 2) expectation of income for an unemployed person. To get the overall expectation of Y , we must take a weighted average of these two values, by taking $E_X[E[Y|X]]$.

Topic Two: Regression Machinery

I am jumping straight to mult. reg

POPULATION

TRUE MODEL:

$$Y_i = \beta_0 + \beta_1 X_{1,i} + \beta_2 X_{2,i} + u_i$$

POPULATION PARAMETERS/COEFFS.

$$\beta_k$$

SAMPLE/ESTIMATES

Estimated model:

$$Y_i = \hat{\beta}_0 + \hat{\beta}_1 X_{1,i} + \hat{\beta}_2 X_{2,i} + u_i$$

ESTIMATES PARAMS:

$$\hat{\beta}_k$$