Damages Update

Simple vs. Multiple Variable Regression

- Simple regression involves one Y (dependent variable) and one X (independent variable)
  - $Y_i = \beta_0 + \beta_1 X_i + u_i,\ i = 1,\ldots,\ n$

- Multiple regression involves more than one X (i.e., multiple independent variables)
  - $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + u_i,\ \ i = 1,\ldots,n$
  - $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i,\ \ i = 1,\ldots,n$
  - *Etc.*

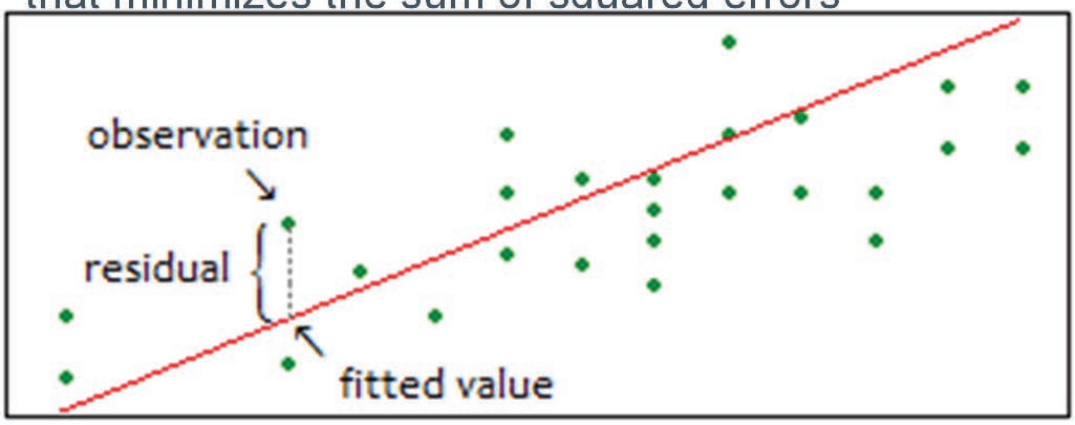
Regression Analyses Of Interest

- Simple vs. multiple variable models
- Hedonic pricing model
- Structural break test

Ordinary Least Squares ("OLS")

- Consider simple linear regression:

  $Y_i = \beta_0 + \beta_1 X_i + u_i$, i = 1,…, n
- OLS involves us putting the regression line in the place that minimizes the sum of squared errors



Ordinary Least Squares ("OLS")

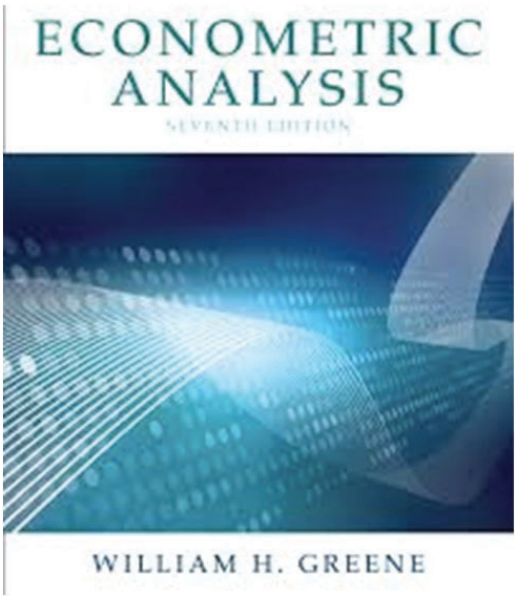
In Math-Speak….

When we use OLS to estimate the unknown parameters β_0 and β_1, we are picking b_0 and b_1 such that they solve the following calculus problem:

$$\min_{b_0,b_1} \sum_{i=1}^{n} [Y_i - (b_0 + b_1 X_i)]^2$$

Why Use Regression?

- Per the classic text by NYU's William Greene:
  - Explore relationships among variables
  - Way to get yes-or-no answer to the question: Is there a significant relationship here?
  - Making predictions



Title search: Damages Update

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