

Homework #3
Economics 113
Introduction to Econometrics
Professor Spearot
Due Wednesday, October 29th, 2008 – Beginning of class

1. Please interpret the slope coefficient in each of the following four specifications:

$$y = \beta_0 + \beta_1 x + \varepsilon$$

$$y = \beta_0 + \beta_1 \log(x) + \varepsilon$$

$$\log(y) = \beta_0 + \beta_1 x + \varepsilon$$

$$\log(y) = \beta_0 + \beta_1 \log(x) + \varepsilon$$

2. For the following examples, discuss whether each satisfy the four assumptions we use for linear regression. If not, which assumptions are violated?

- a) To examine the link between attendance and grades, I construct an indicator variable, *PickUp*, which takes on the value of 1 if a student picked-up his or her exam on Friday, October 17th, and 0 otherwise. I then run the following regression using data for the *entire class*:

$$ExamGrade = \beta_0 + \beta_1 PickUp + \varepsilon$$

- b) To examine the link between studying and grades, I construct a new variable, *Study*, which is the self-reported hours-studied prior to the exam. The sampling was done on Friday, October 17th. Using this sample, I run the following regression:

$$ExamGrade = \beta_0 + \beta_1 Study + \varepsilon$$

3. Taken from Problem 3.7 in Wooldridge

Which of the following can cause OLS estimators to be biased?

- (i) Heteroskedasticity
- (ii) Omitting an important variable
- (iii) A high correlation coefficient (say .95) between two random variables