

Introduction to Econometrics

Fall 2006

Assignment 4

Today's Date: 10/2

Due Date: 10/9

Please show all of your work and clearly indicate your final response to each question.

1. Consider the linear regression model

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

where x is a scalar regressor and ε is a disturbance term. The least squares estimator computed from a sample of n i.i.d. disturbances is given by

$$\hat{\beta}_n = (X'X)^{-1}X'y,$$

where

$$X = \begin{bmatrix} 1 & x_1 \\ 1 & x_2 \\ \vdots & \vdots \\ 1 & x_n \end{bmatrix}$$

and

$$y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix}$$

Assume that

$$E(\varepsilon|x) = \exp(-n),$$

and that

$$\lim_{n \rightarrow \infty} \frac{X'X}{n} = Q,$$

where Q is a positive definite matrix. Is the OLS estimator $\hat{\beta}_n$ unbiased? Is it consistent?

2. W 4.1
3. W 4.4
4. W 4.8
5. W 5.2