

Introduction to Econometrics

Fall 2004

Assignment 10

Today's Date: 12/6/2004

Due Date: 12/13/2004

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

1. W 13.3
2. W 14.1
3. W 14.2
4. Say that you want to estimate the following model:

$$y_{it} = \beta_0 + \beta_1 a_{it} + \beta_2 s_i + \varepsilon_{it}, \quad i = 1, \dots, I; t = 1, \dots, T;$$

where y_{it} is earnings of individual i in period t , a_{it} is the age of individual i in period t , and s_i is the years of schooling completed of individual i . (It is assumed that schooling is completed before the sample period begins and does not change over the sampling period.). We assume that

$$\varepsilon_{it} = \eta_i + u_{it}.$$

We assume that η_i and u_{it} are independently distributed for all (i, t) , and that u_{it} is independently distributed with respect to the regressors. The mean and variance of u_{it} are $(0, \sigma_u^2)$.

1. If η_i is mean independent of the regressors, is the OLS estimator of β unbiased? If so, is it efficient? If not, propose a consistent estimator of β that dominates the OLS estimator in large samples.
2. Describe the fixed effects estimator of the model. Which parameters in β are identified using this estimator? Are these estimators unbiased even if η_i is not mean independent of the regressors?
3. Describe a testing strategy that you could use to decide whether to use the fixed effects or the random effects estimators of β .