Econ 8206: Problem Set 2

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Exercise 1 *Is the fixed effects estimator the same as OLS estimator on first differenced data for the case of T=2? Explain.*

Exercise 2 *(Greene, Chapter 14, Exercise 4) Derive the log-likelihood function for the random effects model*

$$y_{it} = \alpha + \beta' x_{it} + u_i + \epsilon_{it},$$

assuming that ϵ_{it} and u_i are normally distributed. [Hints are in Greene].

Exercise 3 *Consider the production function*

$$\log Y_{it} = \log A_i + \beta \log L_{it} + \epsilon_{it},$$

where L_{it} is labor input of firm i in year t and A_i is firm i's productivity. Assume $\log A_i$ and ϵ_{it} are independent and each normally distributed.

1. *Assuming L_{it} is exogenously determined, compare the random effects and fixed effects estimators of the parameter β in terms of consistency and efficiency.*

2. *Now assume L_{it} is chosen endogenously (firms know A_i but not ϵ_{it}) in order to maximize profits, given price P_{it} and a wage w. Again compare the random effects and fixed effects estimators of the parameter β in terms of consistency and efficiency.*