2020/07/16

Econometrics I's Homework

Deadline: July 22, 2020, PM23:59:59

- The answer should be written in English or Japanese.
- Your name and student ID number should be included in your answer sheet.
- Send your answer to the email address: `tanizaki@econ.osaka-u.ac.jp`.
- The subject should be Econome 1 or 計量 1. Otherwise, your mail may go to the **trash box**.

1 Suppose that u_1, u_2, $\cdots$, u_T are mutually independently distributed with $\mathrm{E}(u_t) = 0$ and $\mathrm{V}(u_t) = \sigma^2$ for all $t = 1, 2, \cdots, T$.

Consider the following regression model:

$$y = X\beta + u,$$

where y, X, β and u are $T \times 1$, $T \times k$, $k \times 1$ and $T \times 1$ matrices or vectors. Answer the following questions.

(1) When X is correlated with u, show that OLSE of β, i.e., $\hat{\beta}$, is inconsistent.

(2) X is correlated with u. Suppose that we have the $T \times k$ matrix Z which is uncorrelated with u and correlated with X. Obtain a consistent estimator of β, usin Z.

(3) Obtain an asymptotic distribution of the consistent estimator in (2).