Microeconometrics

Assignment 4

Question 1

For this exercise you will use the data set WAGES.DTA taken from the Panel Study of Income dynamics, Cornwell and Rupert (*Journal of Applied Econometrics*, 1988). The data set contains observations on 595 individuals over 7 years, 1976-1982.

The list of the variables is as follows:

ID = variable identifying individuals.

YEAR = variable identifying time.

EXP = Years of full-time work experience.

WKS = Weeks worked.

OCC = (OCC=1, if the individual is in a blue-collar occupation).

IND = (IND=1, if the individual works in a manufacturing industry).

SOUTH = (South=1, if the individual resides in the South).

SMSA = (SMSA=1, if the individual resides in a standard metropolitan statistical area).

MS = (MS=1, if the individual is married).

FEM = (FEM=1, if the individual is female).

UNION = (Union=1, if the individual's wage is set by a union contract).

ED = Years of education.

BLK = (BLK=1, if the individual is black).

LWAGE = Logarithm of wage.

Consider the following wage rate equation specifications:

$$w_{it} = \gamma w_{i,t-1} + \underset{\sim}{\beta}' \underset{\sim}{x}_{it} + \delta d_{it} + \alpha_i + u_{it}, \tag{1}$$

$$w_{it} = \underset{\sim}{\beta}' \underset{\sim}{x}_{it} + \delta d_{it} + \alpha_i + u_{it}, \tag{2}$$

where x_{it} stand for years of schooling, experience, industry dummies and occupational dumming, and d_{it} is the union status dummy. Use the Cornwall and Rupert data (*Journal of Applied Econometrics*, (1988) to estimate (1) and (2) by

(1) covariance method (Least Squares dummy variable).

(2) generalized method of moments estimator.

(3) Random Effects Estimator

Use your results to answer the following questions:

(A) Your preferred specification.

(b) Does union membership raise wage rate?

Make sure to give reasons for your answers. vf

Question 2

Consider the model

$$y_{it} = \gamma y_{i,t-1} + \alpha_i + u_{it}, \quad i = 1, \ldots, N,$$
$$t = 0, 1, \ldots, T.$$

Let γ=.5, $u_{it} \sim N(0,1)$, $\alpha_i \sim N(0,1)$. Generate 200 + T observations of y_{it} and throw away the first 200 observations. Consider the case of N=200, T=5 and N=200, T=54. Estimate γ by the simple instrumental variable method, GMM and the MLE. Construct the t-statitic for the null: γ=.5. Replicate the experiment 1000 times. Find the actual size baswed on different estimators using the critical value of 1.96. (for the nominal significance level of 5%).