Week 8 Assignment

Applied Econometrics

1. The sample Moment Condition for the regression model $Y_i = X_i\beta + U_i$; under OLS estimation is;
   a. $\frac{1}{N}\sum X_i'\left(y_i' - X_i'\beta\right) = 0$
   b. $\sum X_i'\left(y_i' - X_i'\beta\right) = 0$
   c. $\sum X_i'\left(y_i' - X_i'\hat{\beta}\right) = 0$
   d. $\frac{1}{N}\sum X_i'\left(y_i' - X_i'\hat{\beta}\right) = 0$
   e. $\frac{1}{N}\sum\left(y_i' - X_i'\hat{\beta}\right) = 0$
2. If number of instruments is equal to the number of parameters to be estimated under IV estimation method for a regression equation where $Z = Set\ of\ Instuments$, Population moment condition will be;
   a. $E\left(X_i u_i\right) = 0$; $where\ X_i = set\ of\ explanatory\ variable,\ u_i = error\ term\ and\ i = 1, 2, \ldots, N$
   b. $E\left(Z_i X_i\right) = 0$; $where\ Z_i = set\ of\ instrument, X_i = set\ of\ explanatory\ variable\ \ and\ i = 1,$
   c. $E\left(Z_i u_i\right) \neq 0$; $where\ Z_i = set\ of\ instrument,\ u_i = error\ term\ and\ i = 1, 2, \ldots, N$
   d. $E\left(X_i u_i\right) \neq 0$; $where\ X_i = set\ of\ explanatory\ variable,\ u_i = error\ term\ and\ i = 1, 2, \ldots, N$
   e. None of the above
3. If number of instruments is more than the number of parameters to be estimated under IV estimation method for a regression equation where $Z = Set\ of\ Instuments$, we can derive a Quadratic Loss Function, in which W_n is nothing but,
   a. A kXL matrix of weights that chosen optimally which gives smallest variance, where L = number of instruments used.
   b. A $L * L$ matrix of weights that is chosen optimally which gives smallest variance, where L = number of instruments used.
   c. A $1 * L$ matrix of weights that chosen optimally which gives smallest variance, where L = number of instruments used.
   d. A $L * 1$ matrix of weights that chosen optimally which gives smallest variance, where L = number of instruments used.
   e. A $L * k$ matrix of weights that chosen optimally which gives smallest variance, where L = number of instruments used and K = Number of parameters to be estimated.
4. In Arellano-Bond estimation method of Dynamic Panel Data Model, all the instruments are coming from;
   a. Outside of the system formed from lag of exogenous and predetermined variables of the model.

b. Within the system formed from lag of exogenous and predetermined variables of the model.
c. Within the system formed from lag of endogenous and predetermined variables of the model.
d. Outside of the system formed from lag of endogenous and predetermined variables of the model.
e. None of the above.

5. Which of the following is true for Dynamic Panel Model?
   a. OLS estimator < True estimator of DPD < Fixed Effects Estimator
   b. OLS estimator ≥ True estimator of DPD ≥ Fixed Effects Estimator
   c. OLS estimator ≤ True estimator of DPD ≤ Fixed Effects Estimator
   d. OLS estimator > True estimator of DPD = Fixed Effects Estimator
   e. None of the above
6. We can purge unobserved individual specific effect from Dynamic Panel Data model by;
   a. Bringing out the unobserved individual specific effect using individual specific dummies
   b. Transforming the model using Fixed Effects
   c. Removing individual specific unobserved effect from each observation and run the regression on the residuals.
   d. Only A & C
   e. All A, B & C

Answer the following questions (7 and 8) using abdata.dta.

Suppose, you want to find out the determinants of firm employment for 140 firms in UK (data can be downloaded using webuse abdata command in STATA), where firm employment is dependent upon previous year's employment for two successive years, wage, previous year's wage, capital, lag of capital for two successive years, actual output, lag of actual output for two successive years. The model is following,

$$n = \rho nL_1 + \beta_1 nL_2 + \beta_2 w + \beta_3 wL_1 + \beta_4 k + \beta_5 kL_1 + \beta_6 kL_2 + \beta_7 ys + \beta_8 ysL_1 + \beta_9 ysL_2 + \beta_{10} yr^* + u_i$$

7. Estimate the above Dynamic Panel Data model using OLS ignoring the dynamism. What will be the coefficient for the variable nL_1 (last year employment)?
   a. 1
   b. 0.965
   c. 0.429
   d. 0.92
   e. 1.045

8. OLS can not be a correct estimator for this model because;
   a. ρ should be greater than 1 to keep the dynamism.
   b. ρ should be less than equal to 1 to keep the dynamism
   c. ρ should be less than 0.5 to keep the dynamism
   d. Both A & C
   e. None of the above