Ref EX/PG/Eco/ 203/2019

Master of Arts Examination 2019
(1st year, 2nd Semester)
Economics
Econometrics II

Time 2 hours Full marks 30

1. a. Consider the following simultaneous equation system

$$C_t = -\gamma_{11} - \alpha_{14} Y_t + u_{1t}$$
$$I_t = -\gamma_{21} - \alpha_{23} R_t - \alpha_{24} Y_t + u_{2t}$$
$$R_t = -\alpha_{34} Y_t - \gamma_{32} M_t + u_{3t}$$
$$Y_t = C_t + I_t + Z_t$$

(i) Write down the system in matrix form.
(ii) Is the system identified?

b. Consider the model with a single regressor X_{it}

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \alpha_i + u_{it}$$

where α_i represents an unobserved effect fixed over time and u_{it} is a homoskedastic error term which is independent over time (t) and individuals (i). There are N randomly sampled individuals, each observed for T = 4 time periods. Assume that E(uit | X) = 0 for all i and that E(uituis | X, any t and s : t ≠ s) = 0, where X represents the NT × 1 data matrix.

Explain how you could test the assumption that E(αi | xit) = 0

[1+9+5]

or.

2. a. You have a sample of N individuals for T years. Suppose you estimate by OLS the annual income equation:

$$Y_{it} = \alpha_0 + \alpha_1 ed_i + \alpha_2 age_{it} + \alpha_3 (ed_i * age_{it}) + u_{it}$$

[Turn over

where ed_i represents the years of education of the ith individual, age_{it} represents the age of the individual i in period t and u_{it} represents all unobservables.

(i) Suppose you estimate γ as 0.82 with the standard error of 0.12. State a set of sufficient assumptions for the consistency of the OLS estimator in this context.

(ii) Describe an alternative estimation technique that you could use to evaluate the validity of some of your assumptions. Justify your choice and explain carefully the conditions under which your alternative estimator is consistent

b. Consider a simultaneous equation system (SES) consisting of 3 endogenous and 3 exogenous variables. Explain how you can use the generalized least square method to estimate that SES.

[4+6+ 5]

3. (a)Define and explain AR(q) and MA(p) . How do you determine the order of AR(q) and MA(p)

(b) Explain the concept of co integration between two variables.

[10+5]

Or,

4 (a) What do you mean by seemingly unrelated regression equation (SURE) model?

(b) Construct a suitable model satisfying the properties of SURE model and derive appropriate estimators of the parameters of such model.

(b) Give Economic examples of such model.

[3+10+2]