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63/1(SEM-5) DSE2/ECOHE5126

2024

ECONOMICS

Paper : ECOHE5126.

[(Applied Econometrics (Option-I))]

Full Marks : 80

Pass Marks : 32

Time : 3 hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option of the following :
(any six) 1×6=6
- (a) Which of the following methods is used in empirical research ?
- (i) Inductive method
 - (ii) Initiative method
 - (iii) Scientific method
 - (iv) Deductive method

- (b) The term research methodology refers to
- (i) the methods used in data collection and analysis
 - (ii) the rules for writing a research report on paper
 - (iii) the specific method for study and analysis
 - (iv) the theoretical paradigms for data collection, analysis and interpretation
- (c) Which of the following tests is used to detect specification errors ?
- (i) Ramsey's RESET test
 - (ii) The Runs test
 - (iii) The Park test
 - (iv) Chow test
- (d) A regression model suffers from the functional form misspecification if
- (i) the dependent variable is binary
 - (ii) an interaction term is omitted
 - (iii) a key variable is binary
 - (iv) the co-efficient of a key variable is zero

- (e) Autoregressive distributed lag models include
- (i) lags of the dependent variable, and lagged values of additional predictor variables
 - (ii) current and lagged values of the error term
 - (iii) current and lagged values of the residuals
 - (iv) lags and leads of the dependent variable
- (f) If OLS is applied separately to each equation that is part of a simultaneous system, the resulting estimates will be
- (i) unbiased and consistent
 - (ii) biased and inconsistent
 - (iii) biased but consistent
 - (iv) it is impossible to apply OLS to equations that are part of a simultaneous system
- (g) Estimation of the instrumental variable regression model
- (i) requires exact identification
 - (ii) allows only one endogeneous regressor, which is typically correlated with the error term

- (iii) is only possible if the number of instruments is the same as the number of regressors
- (iv) requires exact identification or over-identification
- (h) The fixed effects regression model
 - (i) assumes that each unit has a fixed intercept, rather than stochastic conditions
 - (ii) the slope co-efficients are allowed to differ across entities, but the intercepts fixed
 - (iii) has fixed the effect of heteroscedasticity
 - (iv) in a log-log model may include logs of the binary variable which control for the fixed effects.
- (i) What is the name of the statistical test that can help us determine whether to choose a fixed effects or random effects model ?
 - (i) Hausman test
 - (ii) Z-test
 - (iii) Chi-squared test
 - (iv) Link-Wallace test

- (j) Panel data is also called
 - (i) Cross-sectional data
 - (ii) Longitudinal data
 - (iii) Time series data
 - (iv) Experimental data

2. Answer the following questions : **(any five)**
2×5=10

- (a) What is empirical research ?
- (b) What is a distributed lag model ?
- (c) State the differences between endogenous and exogenous variables.
- (d) What is an over-identified system of simultaneous equation ?
- (e) State *two* uses of E Views software in research.
- (f) Define research hypothesis.
- (g) What do you mean by simultaneous equation model in econometrics ?

3. Answer **any six** of the following questions :

5×6=30

- (a) Write the steps involved in conducting empirical research.
- (b) What is specification error ? Mention the reasons of the occurrence of specification error.
- (c) Describe the caution about model selection criteria in economic theory.
- (d) What is panel data ? How does it differ from cross-sectional and time series data ?
- (e) What is autoregressive distributed lag model ? State some features of the autoregressive distributed lag model.
- (f) What is fixed effects model ? Write the differences between fixed and random effects model.
- (g) Differentiate between single equation method and system method. Write the difficulties involved with the system method.
- (h) Discuss the main objectives of model selection in econometrics.

(i) Distinguish between distributed lag model, autoregressive model and autoregressive distributed lag model.

(j) What is reduced form of a simultaneous equation ? Obtain the reduced form of the rational income equation and consumption function from the following Keynesian model of income determination.

$$C_t = \beta_0 + \beta_1 Y_t + u_t$$

$$Y_t = C_t + I_t$$

4. Answer **any two** of the following : 10×2=20

(a) Define autoregressive model. Discuss the estimation methods of autoregressive models. 2+8=10

(b) Discuss the various tests applied for identifying the most efficient model in econometrics. 10

(c) Give *two* examples of statistical software. Discuss the usefulness of statistical software in research. 2+8=10

(d) Write an example of panel data. Discuss the advantages and disadvantages of using panel data in research. 2+8=10

5. Answer **any one** of the following :

14×1=14

(a) What are the issues in specification of econometric model ? Discuss the consequences of omission of an important variable and inclusion of an irrelevant variable in regression model.

4+10=14

(b) Write the advantages and disadvantages of fixed effects model. Explain the random effects technique used for analysing panel data.

6+8=14

(c) What do you mean by an identification problem ? State the necessary and sufficient conditions required for identification.

Examine whether the demand equation of the following macroeconomic model is identified or not.

2+4+8=14

$$Q_d = \beta_1 + \beta_2 P + \beta_3 Y + \beta_4 P_s + U$$

$$Q_s = \alpha_1 + \alpha_2 P + \alpha_3 W + \delta$$

$$Q_d = Q_s$$

where, Q_d - quantity demanded

Q_s - quantity supplied

P - price level

P_s - price of substitute

Y - income

W - labour wages