LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – ECONOMICS

THIRD SEMESTER – NOVEMBER 2018

16/17PEC3MC03 – ADVANCED ECONOMETRICS

Date: 27-10-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

PART A

Answer any **FIVE** of the following questions:-   [5x4=20 marks]

1. Point out the difference between trend stationary process and difference stationary process.
2. Why Tobit regressions are known as censored regressions?
3. Write a note on Chows' prediction failure test.
4. State the assumptions for estimation of the Error Component Model.
5. How Hansen test supports testing of structural break?
6. Given the model, $Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + u_i$,which test statistic is appropriate to test the equality between the two regression coefficients $\beta_3 \ and \ \beta_4$?
7. Highlight the employability of cointegration in time series econometric analysis.

PART B

Answer any **FOUR** of the following questions:-   [4X10=40 marks]

8. Discuss MWD test in choosing between Linear and Log linear regression models.
9. Explain the procedure for estimating panel data using W-G estimators.
10. State the procedure of testing the overall significance of a 'K' variable model using ANOVA approach.
11. Differentiate between VAR models and B-J methodology.
12. A sample of 21 firms were collected to estimate the advertising impressions retained and advertising expenditure incurred by the firm. The results are as follows:

    Model I: $\widehat{Y_i} = 22.163 + 0.3631 X_i$
    Se = (7.089)   (0.0971)
    $R^2 = 0.424$

    Model II: $\widehat{Y_i} = 7.059 + 1.0847 X_i - 0.0040 X_i^2$
    Se = (9.986)   (0.3699)   (0.0019)
    $R^2 = 0.53$

    a. Interpret both the models.   (3 marks)
    b. Which statistical test (s) would you use to choose between the two models? (5 marks)
    c. Which is a better model and why?   (2 marks).

13. From a household budget survey of 1980 of the Dutch Central Bureau of Statistics, J. S. Cramer obtained the following logit model based on a sample of 2820 households. The purpose of the logit model was to determine car ownership as a function of (logarithm of) income. Car ownership is a dichotomous dummy variable:

    $\widehat{L_i} = -2.77231 + 0.347582 \ln Income$
    t =   (- 3.35)   (4.05)
    χ^2 (1 df) = 16.681   p value = 0.0000

    where, ln Li is the estimated logit and ln Income is the logarithm of income.
    a. Interpret the estimated logit model.   (2 marks)
    b. From the estimated logit model, how would you obtain the expression for the probability of car ownership?   (4 marks)

c. What is the probability that a household with an income of 20,000 will own a car? And at an income level of 25,000? What is the rate of change of probability at the income level of 20,000?

(4 marks)

14. Consider the following Wage – determination equation for the Indian economy for the period 1995 – 2014:

$$\widehat{W_t} = 8.582 + 0.364\ (PF)_t + 0.004\ (PF)_{t-1} - 2.560\ U_t$$
$$SE = (1.129) \qquad (0.080) \qquad (0.072) \qquad (0.658)$$
$$R^2 = 0.873 \qquad\qquad d{:}f = 15$$

Where, W = wages and salaries per employee

PF = prices of final output at factor cost

U = Unemployment as a percentage of the total number of employees of India.

t = time period

a. Interpret the preceding equation. (2 marks)

b. Are the estimated coefficients individually significant? (6 marks)

c. What is the rationale for the introduction of $(PF)_{t-1}$? (1 mark)

d. Should the variable $(PF)_{t-1}$ be dropped from the model? why? (1 mark)

PART C

Answer any **TWO** of the following questions:- [2X20=40 marks]

15. Elucidate the Chow test for testing structural or parameter stability.
16. Outline the Probit and Logit models employed for estimating binary response regression models. Support your answer using derivation and suitable diagrams.
17. Elucidate the various tests of stationarity.
18. From the sample of 209 firms, the following regression results were obtained:

$$log\ \widehat{(salary)}_i\ =\ 4.32\ +\ 0.280\ log(sales)_i\ +\ 0.0174\ roe_i\ +\ 0.00024\ ros_i$$
$$se = (0.32) \qquad (0.035) \qquad (0.0041) \qquad (0.00054)$$
$$R^2 = 0.283$$

Where, salary = salary of CEO

sales = annual sales of the firm

roe = return on equity in percent

ros = return on firm's stock

(figures in parentheses are the estimated standard errors)

a) Interpret the preceding regression taking into account any prior expectations that you may have about the signs of the various coefficients. (5 marks)

b) Which of the coefficients are individually statistically significant at 5 percent level? (hint: alpha at 5% for d:f = 1.96). (8 marks)

c) What is the overall significance of the regression? Which test do you use and why? (hint: alpha at 5% for ndf and ddf = 2.60) (4 marks)

d) Can you interpret the coefficients of roe and ros as elasticity coefficients? Why or why not?

(3 marks)

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