



M.Com. (Semester – III) (Acct. and Fin.) Examination, April 2017  
COO3A1 : ECONOMETRICS FOR FINANCE (OA – 18)

Duration : 3 Hours

Max. Marks : 60

- Instructions :** 1) This paper consists of **nine** questions carrying **equal** marks.  
2) Question No. 1 consists of **5 compulsory** questions of **2 marks each**.  
3) Answer **any 5** questions from question 2, 3, 4, 5, 6, 7, 8, and 9.  
4) **Each** question carries **10** marks. Figures to the **right** indicate marks.

1. Answer the following short questions in brief : (5×2=10)
- a) What do you understand by a Linear Regression Model ?
  - b) Give two points of distinction between Homoscedasticity and Heteroscedasticity.
  - c) What is meant by Multiple Co-efficient of Determination ( $R^2$ ) ?
  - d) Mention any two benefits of employing panel data in regression modeling.
  - e) Distinguish between ANOVA and ANCOVA Models.
2. Discuss the traditional econometric methodology with suitable example. 10
3. a) Mention the practical consequences of Multicollinearity. 3
- b) What remedial measures can be taken to alleviate the problem of Multicollinearity ? 7
4. What do you understand by :
- a) Stationary Stochastic Process. 5
  - b) Unit Root Tests. 5
5. a) The following regressions are based on Consumer Price Index (CPI) data for the United States for the period 1960-2007, for a total of 48 annual observations :

$$\overline{\Delta CPI}_t = 0.0334CPI_{t-1}$$

$$t = (12.37)$$

$$R\text{-square} = 0.0703$$

$$d = 0.3663$$

$$DF \text{ (critical)} = - 1.95$$



$$\overline{\Delta\text{CPI}_t} = 1.8662 + 0.0192\text{CPI}_{t-1}$$

$$t = (3.27) \quad (3.86)$$

$$R\text{-square} = 0.249 \quad d = 0.4462 \quad \text{DF (critical)} = 2.93$$

Examine the preceding regressions and comment on the stationarity of Consumer Price Index (CPI) time series. 4

b) Explain the concept of Vector Autoregression (VAR) with suitable example. 6

6. a) Define Spurious Regression. 2

b) From a study to access the impact of beer tax and income on beer consumption across 50 states for the period 1975-2000, the results of Pooled Ordinary Least Square (OLS), Fixed Effects and Random Effects Model are presented below.

Dependent Variable : Beer Consumption

| Variable                          | Pooled OLS         | Fixed Effects Model  | Random Effects Model |
|-----------------------------------|--------------------|----------------------|----------------------|
| Constant                          | 1.4192<br>(24.37)  | 1.7617<br>(52.23)    | 1.7542<br>(39.22)    |
| Beer tax                          | -0.0067<br>(-2.13) | -0.0183<br>(-9.67)   | -0.0181<br>(-9.69)   |
| Income                            | -0.000<br>(-1.12)  | -0.000020<br>(-9.17) | -0.000019<br>(-9.10) |
| R-square                          | 0.0062             | 0.0052               | 0.0052               |
| Adjusted R-square                 | 0.0051             | 0.0049               | 0.0048               |
| F-statistic                       | 10830.51           | 6515.89              | 6712.34              |
| Prob. (F-statistic)               | 0.0000             | 0.0000               | 0.0000               |
| Durbin-Watson stat                | 0.0630             | 0.5206               | 0.3412               |
| Hausman test stat                 | 3.445              |                      |                      |
| Chi-square <sub>0.05</sub> (2 df) | 5.992              |                      |                      |

Figures in parenthesis are the estimated standard errors.

Make necessary interpretations considering the three panel data models. 8



- 7. Explain the concept of Testing of Hypothesis with suitable example. 10
- 8. Consider the equation of salaries of CEOs in terms of annual firm sales, return on equity (roe, in percentage form) and return on the firm's stock (ros, in percentage form).

$$\log(\overline{\text{salary}}) = 4.32 + 0.280 \log(\text{sales}) + 0.174 \text{ roe} + 0.00024 \text{ ros}$$

$$\text{se} = (0.32) \quad (0.35) \quad (0.0041) \quad (0.00054)$$

$$n = 209 \quad R\text{-square} = 0.283 \quad t_{0.05} (205 \text{ df}) = 1.980$$

$$F \text{ stat} = 248.06 \quad P\text{-value} (F) = 0.000$$

- a) Considering the above output, state whether the results concur with priori expectations of signs.
  - b) Compute the t-values and state whether the estimated co-efficients are statistically significant at 5 percent level of significance.
  - c) Interpret the R<sup>2</sup>-value.
  - d) Test the overall significance of the model.
  - e) Assuming the co-efficients of the regressors in the model to be zero, estimate the mean salary of the CEOs. 10
9. The following regression output highlights the literacy rate for population across 19 states for the period 2007-08 :

$$\hat{Y}_i = 75.82 - 16.32D_{2i} + 16.00D_{3i}$$

$$\text{se} = (1.82) \quad (2.10) \quad (2.10)$$

$$t = (41.66) \quad (-7.77) \quad (7.62)$$

$$p = (0.00) \quad (0.00) \quad (0.00)$$

$$R\text{-square} = 0.8921$$

where, Y<sub>i</sub> = literacy rate (percent)

D<sub>2i</sub> = Gender ; 1 = Female, 0 = otherwise

D<sub>3i</sub> = Area of residence ; 1 = Urban, 0 = otherwise

- a) Identify the benchmark category in the regression.
- b) Comment whether the preceding average literacy rates are statistically different as compared to the base category. 10

