ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Economics)

Course: Basic Econometrics (807)

Level: MSc   **Semester: Spring, 2013**
Total Marks: 100

ASSIGNMENT No. 1
(Units 1–4)

Q.1 Discuss in detail the concept of regression analysis in econometrics. Why this analysis is important?   (20)

Q.2 Explain the following concepts in detail: (20)
  i.   Population regression function
  ii.   The meaning of the term linear
  iii. Stochastic specification of PRF
  iv.   The significance of stochastic disturbance term
  v.   The sample regression function (SRF)

Q.3 a) Discuss Maximum Likelihood (ML) method of estimation.   (10)
    b) Given the following data   (10)

Y	X
2.7	4.2
4.2	6.4
6.3	7.7
10.2	8.1
11.3	12.2
15.4	17.2
20.7	25.5
22.8	27.7
24.2	32.6
28.1	40.2

  i.   Fit the regression
        $Y_i = \beta_1 + \beta_2 X_i + u_i$

ii. Compute standard errors of $\hat{\beta}_1 \; and \; \hat{\beta}_2$ and estimate σ^2

iii. Establish 95% confidence intervals for $\beta_1 \; \beta_2$ and σ^2

iv. Test the hypotheses $\beta_1 = 0$ and 2 =0 at 5 percent level of significance.

Q.4 Given the following outcomes: (20)

$$\overline{Y} = 367.7 \quad \overline{X}_2 = 402.8 \quad \overline{X}_3 = 80 \quad \Sigma(Y_i - \overline{Y})^2 = 66042.3$$

$$\Sigma(X_{2i} - \overline{X}_2)^2 = 84855.1 \quad \Sigma(X_{3i} - \overline{X}_3)^2 = 280.0$$

$$\Sigma(Y_i - \overline{Y})(X_{2i} - \overline{X}_2) = 74778.3 \quad \Sigma(Y_i - \overline{Y})(X_{3i} - \overline{X}_3) = 4250.9$$

$$\Sigma(X_{2i} - \overline{X})(X_{3i} - \overline{X}_3) = 4796.0 \quad\quad N = 15$$

Estimate the partial regression coefficients, their standard errors, and the adjusted and unadjusted R^2 values.

Q.5 Given the following data: (20)

$$\overline{Y} = 19.9 \quad S_1 = 7.9 \quad R = X_3 \begin{bmatrix} 1 & 0.44 & -0.34 & -.031 & -0.14 \\ & 1 & 0.25 & -0.19 & -0.35 \\ & & 1 & 0.44 & 0.33 \\ & & & 1 & 0.85 \\ & & & & 1 \end{bmatrix}$$

$$\overline{X}_2 = 49.2 \quad S_2 = 1.3$$
$$\overline{X}_3 = 10.2 \quad S_3 = 4.6$$
$$\overline{X}_4 = 481.4 \quad S_4 = 74.4$$
$$\overline{X}_5 = 41.6 \quad S_5 = 10.8$$

(a) Obtain the regression of Y on four variables and interpret the results.
(b) Obtain R^2 and test the hypothesis that all partial slope coefficients are simultaneously equal to zero.
(c) Obtain $r_{12,3}$ and $r_{14,35}$

ASSIGNMENT No. 2
(Units 5–9)

Q.1 Discusses in detail various methods of detecting multicolinearity. (20)

Q.2 Discuss in detail the consequences of heteroscedasticity. Also discuss various methods of detection of hetero. (20)

Q.3 Discuss in detail the consequences of autocorrelation. Also discuss various methods of detection of Autocorrelation. (20)

Q.4 (a) Discuss the nature of dummy variables with a suitable example. (10)
   (b) Giving the following regression. (10)
   $Y_i = \theta_1 + \theta_2 D_{2i} + \theta_3 D_{3i} + \theta 4 (D_{2i} D_{3i}) + \delta X_i + u_i$
   Where Y_i + Annual salary of a university teacher
   X_i = Years of teaching experience
   $D_2 = 1$ if male and zero otherwise
   $D_3 = 1$ if foreign qualified and zero otherwise
   (i)   What is meant by interaction effect $(D_{2i} D_{3i})$
   (ii)   What is the meaning of coefficient θ_4
   (iii) Find E $(Y_i | D_2 = 1, D_3 = 1, X_i)$ and interpret it

Q.5 Discuss the role of time or lag in economics. Also give the Almond approach to distributed– lag models. (20)