

CHUKA



UNIVERSITY

RESIT/ SPECIAL EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN ECONOMICS

ECON 331: ECONOMETRICS I

STREAMS:

TIME: 2 HOURS

DAY/DATE: THURSDAY 26/07/2018

2.30 PM – 4.30 PM

INSTRUCTIONS:

Answer Question One and any other Two Questions

QUESTION ONE

- a) Derive the normal equations of a multiple regression model of the form

$$Y_i = b_0 + b_1 X_{i1} + b_2 X_{i2} + U_i \quad [10 \text{ Marks}]$$

- b) The quantity supplied of a commodity (X) is assumed to be linear function of the price X(P) and the wage rate of labour (W), used in the production of X, the population supply function is given as:

$$Q_i = b_0 + b_1 P_i + b_2 W_i + U_i$$

Where :

Q_i = Quantity supplied of XP_i = Price of XW_i = Wage rate

Use the sample data from the following table:

Y=Q	10	35	30	47	60	68	76	90	100	105	130	140	125	120	135
X1=P	10	15	21	26	40	37	42	33	30	38	60	65	50	35	42
X2=	12	10	9	8	5	7	4	5	7	5	3	4	3	1	2

W															
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Intermediate results:

$$\Sigma Y = 1281$$

$$\Sigma X_1 = 544$$

$$\Sigma X_2 = 85$$

$$\Sigma X_1 Y = 53665$$

$$\Sigma X_1 X_2 = 22922$$

$$\Sigma X_1 X_2 = 2568$$

$$\Sigma X_2 Y = 5706$$

$$\Sigma Y^2 = 132609$$

$$\Sigma X_2^2$$

- i. Estimate the parameters of OLS [10 Marks]
- ii. Compute the percentage of variation in Y as explained by both P and W [5 Marks]
- iii. Test the statistical significance of the individual co-efficient at $\alpha = 5\%$ [5 Marks]

Question Two

Consider the following model

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \mu_i$$

Where:

Y = Expenditure

X1 = Income

X2 = Wealth

It is also known that low incomes are associated with low wealth and high incomes with abundant wealth.

- i. What problems are you likely to encounter in the estimation of this model? [2 Marks]
- ii. If the problem is severe, what are the likely consequences? [6 Marks]
- iii. How can you go about remedying the problem? [8 Marks]
- iv. Why can the following consumption function not be estimated?

$$C_1 = \beta_0 + \beta_1 Y_{dt} + \beta_2 Y_{dt-1} + \beta_3 \Delta Y_{dt} + \mu$$

Where $\Delta Y_{dt} = Y_{dt} - Y_{dt-1}$

Question Three

Table 1 gives the real per capita income, to the nearest 1,000 US dollars, Y1 in 15 developed countries and the corresponding percentage of labour force in agriculture, X1 to the nearest percent in the year 2008.

- i. Estimate the regression equation of Y1 on X1 [6 Marks]
- ii. Test the 5% level of significance for the statistical significance of the parameters [5 Marks]
- iii. Find the co-efficient of determination [3 Marks]
- iv. Report all the previous results in standard summary form [2 Marks]

Table 1 per capita income, Y1 (in thousand U.S. Dollars), and percentage of the labour force in agriculture, X1 in 15 developed countries in 2008.

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Y1	6	8	8	7	7	12	9	8	9	10	10	11	9	10	11
X1	9	10	8	7	10	4	5	5	6	8	7	4	9	5	8

v) Given that $r=0.6$ and $N = 64$, find out the probable error of the co-efficient of correlation and determine the limits of the population r .

Question Four

With the help of examples, distinguish the following terms as used in econometric:

- i. Behavioral models and technical relationship model [5 Marks]
 - ii. Macro-models and Micro-models [5 Marks]
 - iii. Impact multipliers and predetermined variables [5 Marks]
 - iv. Autocorrelation and heteroscedasticity [5 Marks]
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