

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF MASTER OF SCIENCE
DEGREE IN ECONOMICS

MSEC 831: ECONOMETRICS

STREAMS: MSEC Y1S2

TIME: 3 HOURS

DAY/DATE: WEDNESDAY 5/12/2018

2.30 P.M - 5.30 P.M.

INSTRUCTIONS:

- Answer Question ONE (COMPULSORY) and any THREE Questions
- Do not write anything on the question paper

QUESTION ONE -COMPULSORY

Multicollinearity will always be an headache when investigating a problem with many variables.

- (i) Discuss various methods you as an econometrician would always use to detect that you have multicollinearity problem in your model. [3 Marks]
- (ii) Outline the various approaches you would use to handle the problem. [3 Marks]
- (iii) In your opinion, do these approaches provide any better estimates of your parameters? Explain your answer with the help of examples of your choice. [10 Marks]
- (iv) Outline consequences of multicollinearity. [5 Marks]
- (v) Explain in details how you will run a linear regression using SPSS. Outline and explain all the possible features found in the SPSS output that will enable you identify the problem of multicollinearity. [9 Marks]

QUESTION TWO

(a) Re-write the following model in the required forms:

$$Y_i = \beta_1 + \beta_2 X_{i2} + \beta_3 X_{i3} + \beta_4 X_{i4} + \epsilon_i$$

- (i) In summation notation [3 Marks]

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(ii) In matrix form, inserting the dimensions of the matrices in the equations write out the 6th equation of the above model. [5 Marks]

(b) For the regression model given below:

$$Y_{n \times 1} = X_{n \times k} \beta_{k \times 1} + \epsilon_{n \times 1}$$

Determine:

- (i) The expectation of Y [3 Marks]
- (ii) Cov. (Y)
- (iii) Cov (ϵ_i)

QUESTION THREE

The money market of an economy is defined with the following model.

$$M_D = \alpha_0 + \alpha_1 Y + \alpha_2 r + \alpha_3 P + \epsilon_i$$

$$M_s = \beta_0 + \beta_1 Y + \beta_2 Y_{t-1} + \beta_3 M_{t-1} + \epsilon_2$$

$M_D = M_s = M$ where:

M_D, M_s - Demand and supply of money

Y - Income

r - Rate of interest

P - price

- (i) Determine the identification state of each of the equations in the system. [5 Marks]
- (ii) State the method you would use to estimate the functions. [3 Marks]
- (iii) After finding out that β_2 and β_3 are statistically insignificant, the supply function is redefined excluding Y_{t-1} and M_{t-1} . What is the identification state of each of the equations? [8 Marks]
- (iv) Which estimation methods would you use in this case? [4 Marks]

QUESTION FOUR

To assess the impact of capacity utilization on inflation, an econometrician obtained the following results (t- ratios in parenthesis) using annual time series data for 20 years.

$$Y_t = -40.153 + 0.1532 X_t + 0.2540 X_{t-1}$$

(-9.354) (3.751) (5.778)

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Where: Y_t - Inflation rate in year “t”

X_t - Capacity utilization in manufacturing in year “t”

X_{t-1} - Capacity utilization in the year t-1

- (i) Establish whether the estimated model is a distributed lag model or an autoregressive model. [2 Marks]
- (ii) Compute the short run and long run multipliers. [3 Marks]
- (a) Discuss four main limitations of Koyck’s transformation. [8 Marks]
- (b) What are the advantages and disadvantages of Almon lag scheme. [7 Marks]

QUESTION FIVE

- (i) Derive the normal equations of a simple regression model using the matrix method. [10 Marks]
- (ii) State and prove all the properties of this model. [10 Marks]

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