



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF ECONOMICS AND STATISTICS

BACHELOR OF ECONOMICS

EES 401: FUNDAMENTALS OF ECONOMETRICS II

DATE: 23/9/2019

TIME: 11:00 – 1:00 PM

INSTRUCTIONS:

Answer Question **ONE** and any other **TWO** questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Distinguish clearly between order and rank conditions of identification, making explicit the steps for tracing identifiability of equations (10 marks)
- b) Consider the following demand and supply model for money

$$\text{Money demand: } M_t^d = \beta_0 + \beta_1 Y_t + \beta_2 R_t + \beta_3 P_t + \mu_{1t}$$

$$\text{Money Supply: } M_t^s = \alpha_0 + \alpha_1 Y_t + \mu_{2t}$$

Where M=money, Y= Income, R= rate of interest, P=price, μ =error terms. Assume R and P are exogenous and M and Y are endogenous.

- i) Obtain the reduced form equations for M and Y (4 marks)
- ii) Test for identifiability of the demand and supply functions (6 marks)
- c) Consider the following extended Keynesian model for income determination

$$C_t = \beta_1 + \beta_2 Y_t - \beta_3 T_t + \beta_4 P_t + \mu_{1t}$$

$$I_t = \alpha_0 + \alpha_1 Y_{t-1} + \mu_{2t}$$

$$T_t = \gamma_0 + \gamma_1 Y_t + \mu_{3t}$$

$$Y_t = C_t + I_t + G_t$$

Where C, I, T, Y, G represents Consumption, Investment, Taxes, Income and Government expenditure respectively. μ 's are the disturbance terms. Use the rank condition to test for identifiability of C and Y. (10 marks)

QUESTION TWO (20 MARKS)

- a) The models below relate sales(Y) and advertising expenditure(X) for a sample of 21 firms

$$(i) \quad Y_i = 22.163 + 0.3631X_i$$

se (7.089) (0.0971) $R^2 = 0.424$

$$(ii) \quad Y_i = 7.059 + 1.0847X_i - 0.0040X_i^2$$

se (9.986) (0.3699) (0.0019) $R^2 = 0.53$

How would you choose between models 1 and 2? What statistical test would you use to answer this question? Show all your calculations.

(Hint: one model has imposed a zero parameter restriction on a certain variable)

(12 marks)

- b) The Chow test is useful tool to check for stability of regression parameters and thus structural change. Explain clearly the steps/mechanisms of the Chow test. (8 marks)

QUESTION THREE (20 MARKS)

- a) Discuss clearly why it is important to be cautious when incorporating dummy variables in regression models. (10 marks)

- b) The earnings (Y) of workers in a given firm are hypothesized to be a function of gender (D1), religion(D2) and education (X=years of schooling). The estimated regression model takes the following form:

$$Y_i = -0.2610 - 2.3606D1_i - 1.7327D2_i + 0.8028D2X_i$$

$$t = (-0.2357) \quad (-5.4873) \quad (-2.1803) \quad (9.9094) \quad R^2 = 0.424 \quad n=528$$

- (i) Interpret the results of the model (6 marks)

- (ii) Find the mean salaries by gender and religion (4 marks)

QUESTION FOUR (20 MARKS)

- a) Distinguish clearly between distributive-lag and autoregressive models. (4 marks)

- b) Discuss clearly three main reasons why lags may occur in economic variables

(6 marks)

- c) Koyck assumes that coefficients of a distributed-lag model decline geometrically with the number of lags. A distributed-lag models results are found to be:

$$Y_t = 8.27 + 0.111X_t + 0.064X_{t-1} - 0.055X_{t-2}$$

- i) Illustrate that Koyck's assumption is true for $\lambda = 0.2$ and $0 \leq K \leq 5$ (3 marks)
- ii) Evaluate the mean and median lags for $\lambda = 0.2, 0.4, 0.6, 0.8$ (7 marks)

QUESTION FIVE (20 MARKS)

- a) With use of appropriate examples, explain clearly the meaning of the following concepts: (8 marks)
- (i) Random Walk Variables
 - (ii) Deterministic trend
 - (iii) Spurious regression
 - (iv) Unit root process
- b) In simultaneous equations;
- i) What problem is one likely to face when estimating simultaneous equation system using OLS? (2 marks)
 - ii) What alternative estimation methods should be used to overcome problems discussed in b (i) above? (6 marks)
 - iii) What is identification problem? (4 marks)