



MACHAKOS UNIVERSITY

University Examinations for 2017/2018

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS

EES 401: FUNDAMENTALS OF ECONOMETRICS II

DATE: 6/12/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS TO CANDIDATES

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

QUESTION ONE (COMPULSORY 30MARKS)

- (a) Distinguish clearly between order and rank conditions of identification, making explicit the steps for tracing identifiability of equations (10marks)
- (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
(6marks)
- (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

$$(i) \quad Y_t = 22.163 + 0.3631X_t$$

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

$$(ii) \quad Y_t = 7.059 + 1.0847X_t - 0.0040X_t^2$$

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:

$$Y_t = -0.2610 - 2.3606D1_t - 1.7327D2_t + 0.8028D2X_t$$

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

- (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 model's 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:

(i) Random Walk Variables

(ii) Deterministic trend

(iii) Spurious regression

(iv) Unit root process

- (b) The model for private sector housing (X) for the period 1948 to 1984 or HFCK was as follows:

$$X_t = 31.03 - 0.188X_{t-1} - 0.055X_{t-2}$$

$$Se = (12.50) \quad (0.080) \quad R^2 = 0.424 \quad n=528$$

$$(t=) \quad T(-2.35)$$

On the basis of these results, is the housing time series stationary or non-stationary?

(8 marks)