



UNIVERSITY OF KABIANGA

UNIVERSITY EXAMINATIONS

2017/2018 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER EXAMINATION

**FOR THE DEGREE OF
BACHELOR OF ARTS IN ECONOMICS**

COURSE CODE: ECO 413

COURSE TITLE: ECONOMETRICS 'II'

DATE: 10TH JULY, 2018

TIME: 2.00 P.M. – 5.00 P.M.

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF (6) PRINTED PAGES

PLEASE TURN OVER

MAIN CAMPUS

140800e

UNIVERSITY OF KABIANGA
SCHOOL OF BUSINESS AND ECONOMICS

UNIVERSITY EXAMINATIONS 2017/2018

FOURTH YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE
OF
BACHELOR OF ARTS IN ECONOMICS

MAIN

ECO 413: ECONOMETRICS 'II'

DATE: JULY 2018

DURATION: 3 HRS

Instructions: Answer Question ONE and other THREE. Answer Each on a New Page.

QUESTION ONE [25 Marks] ✓

[a.] Discuss the following terms as used in econometrics.

- [i.] Dummy variable
- [ii.] Structural equations
- [iii.] Just identified equation

[9 Marks]

[b.] Suppose that data from a large corporation were used to estimate a regression model that explains the Corporation's wage or Salary structure. The estimated equation is.

$$\text{Salary} = 10,000 + 1,000(\text{years employed}) + 1,000X_1 + 3,000X_2 - 2,000S$$

Where;

$X_1 = 1$ if **B.A.** degree and 0, otherwise

$X_2 = 1$ if **Masters** or **Ph.D.**, and 0, otherwise

$S = 1$ if female, and 0, otherwise

- [i.] Suppose a female **Ph.D.** has been employed for 4 years. Predict her salary. [1 Mark]
- [ii.] Suppose a male with no college degree has been employed for 5 years. Predict his salary. [1 Mark]
- [iii.] What is the difference in starting salaries between a **B.A.** and a **Ph.D.** recruit of the same sex? [1 Mark]

[iv.] Interpret the coefficient of **S**. How would the coefficient change if we let **S = 1** if male and 0, otherwise? [3 Marks]

[c.] [i.] Consider the cross-section regression.

$$\text{Income} = \beta_1 + \beta_2 \text{Education} + \beta_3 \text{Male} + \varepsilon_{1t}$$

Where Education is the person's years of schooling and Male are equal to 1 if individual is male and 0 otherwise. Show how the intercept changes for males compared to females. [4 Marks]

[ii.] Now, let the regression be;

$$\text{Income} = \beta_1 + \beta_2 \text{Education} + \beta_3 [\text{Education} * \text{Male}] + \varepsilon_{1t}$$

Show how the slope coefficient for Education differs for males compared to females. [3 Marks]

[d.] Justify the existence of simultaneous equations in Econometrics.

[3 Marks]

QUESTION TWO [15 Marks]

[a.] Consider the following Keynesian model;

$$Y_t = C_t + I_t$$

$$C_t = \beta_0 Y_t + u_t$$

Use the **ILS** method to derive the structural estimates of the model.

[7 Marks]

[b.] Establish whether the following models are; just identified, Over-identified, or under-identified?

$$C_t = \beta_0 + \beta_1 Y_t - \beta_2 T_t + u_t$$

$$I_t = \beta_0 + \beta_1 Y_{t-1} + u_t$$

$$T_t = \beta_0 + \beta_1 Y_t + u_t$$

$$Y_t = C_t + I_t + G_t$$

[8 Marks]

QUESTION THREE [15 Marks]

[a.] Consider the following simultaneous equation models

$$Y_{1t} = \beta_{10} + \beta_{12}Y_{2t} + \alpha_{11}X_{1t} + \epsilon_{1t}$$

$$Y_{2t} = \beta_{20} + \beta_{21}Y_{1t} + \alpha_{22}X_{2t} + \epsilon_{2t}$$

Required;

- [i.] Obtain the reduced-form equations for this model **[4 Marks]**
- [ii.] What is the relationship between the reduced-form coefficients from [i.] above? **[3 Marks]**
- [iii.] Given that the estimated reduced-form equations are as follows (error terms now omitted);

$$Y_{1t} = 4 + 3X_{1t} + 8X_{2t}$$

$$Y_{2t} = 2 + 6X_{1t} + 10X_{2t}$$

Obtain the values of the structural parameters.
(coefficients) **[3 Marks]**

- [iv.] Summarize in table form for each equation; the **direct**, **indirect** and **total effects** of explanatory variable(s) on the dependent variable.

Equation	Effects	Constant	X _{1t}	X _{2t}
Y _{1t}	Total			
	Direct			
	Indirect			
Y _{2t}	Total			
	Direct			
	Indirect			

QUESTION FOUR [15 Marks] ✖

- [a.] A study of the labor force participation of women was done and the resulting regression equation given as;

$$\hat{D}_i = Pr(D_i = 1) = -0.28 - 0.38M_i + 0.09S_i$$

$$N=30, R^2= 0.32, R_p^2=0.81$$

Where; $D_i= 1$ if the i th woman is in the labor force, 0 otherwise

$M_i= 1$ if married, 0 otherwise

$S_i=$ years of schooling of the i th woman.

Required

- [i.] Interpret the coefficient of -0.38? **[5 Marks]**
- [ii.] Interpret the coefficient of 0.09? **[5 Marks]**
- [iii.] Explain the $R^2= 0.32$? **[5 Marks]**

QUESTION FIVE [15 Marks] ✖

Consider the following data which shows sales in thousands of Kenya Shillings for a sales person as a function of their specialization while in college.

S/No.	Sales in 000's of Ksh.	Area of specialization in College
1.	48	Marketing
2.	41	Marketing
3.	29	Management
4.	38	Finance
5.	43	Marketing
6.	33	Management
7.	43	Finance
8.	42	Marketing
9.	37	Finance

10.	46	Marketing
11.	30	Management
12.	46	Finance
13.	35	Finance
14.	37	Management
15.	51	Marketing

Required:

- [i.] By taking finance as the reference category, regress sales on area of specialization. **[1 Marks]**
 - [ii.] Interpret the results of the estimated regression model. **[2Mks]**
 - [iii.] What sales value will a sales person with finance option make? **[2Mks]**
 - [iv.] The value for $R^2 = 0.6710$, interpret this value. **[1Mark]**
 - [v.] Evaluate the value for adjusted R^2 and interpret your results. **[1Mark]**
 - [v.] Test for the overall significance of the model given that F-Critical, $(F_{k-1, n-k, 5\%} = 3.89)$ **[2Marks]**
- [b.] Using relevant examples, explain the following terms as used in Econometrics analysis;
- [i.] ANOVA **[2 Marks]**
 - [ii.] ANCOVA **[2 Marks]**
 - [iii.] Dummy variable **[2 Marks]**