



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION WITH INFORMATION TECHNOLOGY

MAIN & CITY CAMPUS

AEC 411: ELEMENTARY ECONOMETRICS


Date: 18th April, 2016

Time: 8.30 - 10.30am

INSTRUCTIONS:

- **Answer Question ONE (Compulsory) and any other TWO**

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Question One (Compulsory)

- a) Econometrics is the life of an economist. Discuss the goals of econometrics outlining its importance to economics. (6 marks)

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- a) Econometrics is the life of an economist. Discuss the goals of econometrics outlining its importance to economics. (6 marks)
- b) Discuss the desirable properties of an econometric model (4 marks)
- c) The following table gives the regression results of the relationships between consumption and GDP in four economies. The sample period of estimation is covered from 1980-1 to 1999-4, and the regression equation is specified as:

$$\text{Consumption}_{it} = \beta_1 + \beta_2 \text{GDP}_{it} + u_{it}$$

Where t is the year and i is the economy. The regression results are as following:

Dependent Variable	Constant	Independent Variable-GDP	R ²	SEE	σ_y	N
China Kong: HKCON (t-values)	-1040.638 (-1.123)	0.5996 (122.433)	0.9948	4397.97	61125.15	79
Japan: JPCON	-5408.162 (-2.062)	0.6055 (93.753)	0.9915	5125.91	55360.39	77
UK: UKCON	-22.039 (-20.971)	0.6735 (350.112)	0.9993	3.284	131.953	77
US: USCON	-256.459 (-25.368)	0.7138 (409.633)	0.9995	27.366	60465.54	78

Data source: IFS-CD-ROM

- i). What do you interpret the β_2 in economics? (1 marks)
- ii). For the regression result of China, test the hypothesis that whether β_2 is greater than Zero. (Use a 5% level of significance, and state the hypotheses) (7 marks)
- iii). Test the hypothesis that whether the consumption behavior of China is similar to Japan, and also test whether it is similar to the UK and the US. (Use a 10% level of significance.) (10 marks)
- iv). What general conclusions can you draw about the behavior of consumption in the four countries? (2 marks)

Question Two

- a) State each of the assumptions of classical linear regression model and give an intuitive explanation of the meaning and need of each of them. (12 marks)
- b) Briefly and clearly explain what is meant by autocorrelation and why is it a problem in econometric analysis (6 marks)
- c) Suppose you have the following pairs of dependent and independent variables to run the regression, decide what would be the expected sign of the coefficient (β_1) of your regression equation, i.e. $Y = \beta_0 + \beta_1 X + \epsilon$. Briefly explain your reason(s) with economic meaning.
- The GDP growth and the foreign direct investment (FDI) in Kenya
 - The government expenditure and the percent growth of public school enrolment.
 - The tax rate in a year and the average hair length of male in the same year.
 - The participation rate of all women over 16 and the unemployment rate in the same year. (4 marks)

Question Three

- a) Define the terms "heteroskedasticity" and homoskedasticity". Explain the effects of heteroskedasticity on the estimates of the parameters and the variances in a normal regression model (8 marks)
- b) Discuss the sources of multicollinearity and its practical consequences in time series analysis. (12 marks)

Question Four

- a) Using an illustration, prove that the correlation coefficient will assume the value of unit when the variables are perfectly correlated or all the observations lie on a line with a positive or negative slope. (6 marks)
- b) What is the benefit of showing the unbiasedness of an estimator over showing its consistency? (4 marks)
- c) What are the relations between the F and R^2 , and between R^2 and \bar{R}^2 ? (4 marks)
- d) Describe the criteria of evaluating the estimates in an econometric model (6 marks)

Question Five

In a study of early retirements, the regression estimated results of model A was obtained from EVIEWS as following Figure 1:

Figure 1

Dependent Variable: RETIRE
 Method: Least Squares
 Date: 02/26/01 Time: 15:23
 Sample: 1 44
 Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.093346	3.167467	-1.608019	0.1159
DISAB	1.595767	0.245532	6.499228	0.0000
UNEMP	0.557428	0.241641	2.306837	0.0265
DEP	0.153693	0.083463	1.841451	0.0732
RACE	0.083473	0.024087	3.465603	0.0013
R-squared	0.701466	Mean dependent var		11.22955
Adjusted R-squared	0.670847	S.D. dependent var		3.697742
S.E. of regression	2.121464	Akaike info criterion		4.448735
Sum squared resid	175.5230	Schwarz criterion		4.651484
Log likelihood	-92.87217	F-statistic		22.90955
Durbin-Watson stat	1.980595	Prob(F-statistic)		0.000000

Where:

- RETIRE** = Percentage of retired men between the ages of 16 and 65
DISAB = Percentage of people between 16 and 64 years who are prevented from working due to disability.
UNEMP = Unemployment rate (in percent)
DEP = Percentage of households that with children under 18
RACE = Percentage of men who are not white.

- (a) Test the regression model for overall significance. (5 marks)
 (b) Test the hypothesis that the coefficient of **DEP** is statistically significant greater than zero. {Note: State your null and alternative hypotheses, test statistics, distribution and degree of freedom, the decision rule and criterion to reject or not reject the null}. (10 marks)
 (c) What are the interpretations of the estimated coefficients? (2 marks)
 (d) What does Durbin-Watson Stat measure? Interpret its statistics (3 marks)