

NATIONAL UNIVERSITY OF LESOTHO (NUL)

FACULTY OF AGRICULTURE

DEPARTMENT OF AGRICULTURAL ECONOMICS & EXTENSION

AEC 3410: INTRODUCTION TO ECONOMETRICS

MAY/JUNE 2023

TIME: 3 HOURS

INSTRUCTIONS:

1. This paper contains **TWO** Sections and **SIX** Questions
2. Answer **ALL** questions in **Section A** and any **three (3)** questions in Section B.
Section A carries **40 marks** and **Section B** carries **60 marks**
3. Marks allocated for each question or parts thereof are indicated in brackets
4. Clearly and correctly label all your answers
5. Start each question on a new page.
6. **A calculator** is required as additional material

SECTION A: Answer **ALL** questions.

QUESTION 1

Table 1.1 below relate to the data about USA economy for the period 1982–1996. Data on **Y**: represents Personal Consumption Expenditure (PCE) and **X**: Gross Domestic Product 1982–1996, both in billions of dollars.

TABLE I.1 DATA ON Y (PERSONAL CONSUMPTION EXPENDITURE) AND X (GROSS DOMESTIC PRODUCT, 1982–1996), BOTH IN 1992 BILLIONS OF DOLLARS

Year	Y	X
1982	3081.5	4620.3
1983	3240.6	4803.7
1984	3407.6	5140.1
1985	3566.5	5323.5
1986	3708.7	5487.7
1987	3822.3	5649.5
1988	3972.7	5865.2
1989	4064.6	6062.0
1990	4132.2	6136.3
1991	4105.8	6079.4
1992	4219.8	6244.4
1993	4343.6	6389.6
1994	4486.0	6610.7
1995	4595.3	6742.1
1996	4714.1	6928.4

Source: Economic Report of the President, 1998, Table B–2, p. 282.

The estimates of β_1 and β_2 , are -184.08 and 0.7064 respectively. Thus, the estimated consumption function is:

$$\hat{Y} = -184.08 + 0.7064X_i$$

a) Predict the mean consumption expenditure for 1997, given that the GDP value for 1997 was 7269.8 billion dollars [7]

b) Suppose further the government believes that consumer expenditure of about 4900 (billions of 1992 dollars) will keep the unemployment rate at its current level of about 4.2 percent (early 2000). What level of income will guarantee the target amount of consumption expenditure? [8]

c) Given the above information, suppose the President decides to propose a reduction in the income tax. What will be the effect of such a policy on income and thereby on consumption expenditure and ultimately on employment? [5]

Please note: income multiplier M , is defined as:

$$M = \frac{1}{1 - MPC}$$

[20]

QUESTION 2

a) Giving relevant examples define the following types of data:

i. Time series data [5]

ii. Cross sectional data [5]

iii. Panel data [5]

b) Explain **five** factors which can affect accuracy of data for econometric analysis. [5]

[20]

SECTION B: Answer any **THREE** questions.

QUESTION 3

Explain the following five steps of the traditional econometric methodology

i. Statement of theory or hypothesis. [4]

ii. Specification of the mathematical model of the theory. [4]

iii. Specification of the statistical, or econometric, model. [4]

iv. Hypothesis testing [4]

v. Forecasting or prediction. [4]

[20]

QUESTION 4

(a) Distinguish between the following **two** categories of econometrics.

i. Theoretical econometrics. [5]

ii. Applied econometrics. [5]

(b) Explain what you need to consider when choosing a Regression Model. [5]

(c) Describe how econometric models are used for control of policy purposes. [5]
[20]

QUESTION 5

a) Distinguish between the following terms:

- i. Statistical versus deterministic relationship. [10]
 - ii. Regression versus correlation. [10]
- [20]

QUESTION 6

a) State any **four** sources of data. [4]

b) Explain the following measurement scales of variables:

- i. Ratio scale. [4]
 - ii. Interval scale. [4]
 - iii. Ordinal scale. [4]
 - iv. Nominal scale. [4]
- [20]

END OF EXAMINATION PAPER!!!