



**NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
2020_1 EXAMINATION**

COURSE TITLE: APPLIED ECONOMETRICS I

COURSE CODE: ECO 453

UNITS: 2

TIME ALLOWED: 2 HOURS

INSTRUCTIONS: ANSWER ANY THREE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS. ONE MARK FOR CLARITY

1.
 - a. i. Define econometrics and why is econometrics Applied? **5marks**
 - ii. As an econometrician, justify the basic tool of econometrics and itemize its properties. **5marks**
 - b. An economic model is a representation of a theory or part of a theory, often used to gain insight into cause and effect. Justify this assertion by specifying and defining an appropriate econometric model as theorized by Okun's Law. **10marks**
 - c. Amidst the methodology of econometrics, discuss the importance of regression methods. **3marks**

2. The results of logit and probit model as extracted from Stata expressing the effect of age, disease, income on health and the effect of price, household income and basket are presented in table 1 and 2 below.

Table 1: Marginal effects, predict (outcome (3))

Marginal effects after ologit

$Y = \text{Pr}(\text{hlthstat} = 3)$ (Predict, outcome (3))

| Variable | dy/dx | Std Err | Z | P> z | [95% C.I] | X |
|----------|------------|---------|--------|-------|--------------------|-----------|
| Inc | 0.0806161 | .00586 | 13.76 | 0.000 | 0.05924 0.8179 | 7.6969 |
| Disease | -0.0247814 | .00101 | -24.54 | 0.000 | -0.015655 0.011689 | - 10.2053 |
| Age | 0.0083936 | .00042 | 19.98 | 0.000 | 0.008101 0.006463 | 28.5761 |

Table 2:

Marginal effects after mlogit

Y = Pr(hlthstat ==4)

(Predict, outcome (4))

.43293908

| Variable | dy/dx | Std. Err | Z | P>/z/ | [95% C.I] | X |
|----------|------------|----------|--------|-------|----------------------|----------|
| Price | -0.0041524 | .00046 | 13.76 | 0.000 | 0.002953 0.001352 | 52.082 |
| HHI | -0.5277016 | .05631 | -24.54 | 0.000 | 0.335178 0.389368 | 0.389368 |
| Basket | 0.0452243 | .00689 | -19.98 | 0.000 | 0.058513 4.09934 | 4.09934 |

- i. Identify the models in table 1 and 2. **5marks**
- ii. Provide a brief interpretation of the results in table 1 and 2. **18marks**

3. In panel data analysis, Hausman test is used to decide which model; Fixed effect or Random effect is most appropriate. Describe the procedure in conducting Hausman test using Eviews. **23marks**

4. (a) In econometric research, there are four main stages. Discuss these stages as presented chronologically:

- i. Model Specification **4marks**
- ii. Model Estimation **4marks**
- iii. Evaluation of Model Estimates **4marks**
- iv. Testing the forecasting power of the estimated model **4marks**

(b) Discuss briefly, in clear terms, the difference between an economic model and an econometrics model. **7marks**

5. a) i. What is an Auto-regressive (AR) Model? **5marks**

ii. Specify a second-order auto-regressive econometric model of Gross Domestic Product at time t (GDP_t). **2marks**

iii. What are the usefulness of AR model? **4marks**

(b) i. What are the statistical implication of the existence of Serial Correlation using OLS technique? **3marks**

ii. How do you detect the existence of serial correlation using the regression residual approach (Correlogram approach). **5marks**

iii. List the causes of serial correlation in a regression model. **4mark**