UNIVERSITY OF ESWATINI

SECOND SEMESTER RESIT EXAMINATION PAPER, DECEMBER 2021

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

COURSE CODE: ECO420

TITLE OF PAPER: ECONOMETRIC METHODS II

TIME ALLOWED: 2 HOURS

Instructions

1. This paper consists of two (2) sections, A and B
2. Section A, is compulsory and carries 40 marks
3. Section B, contains three (3) questions
4. Answer any other two (2) questions in Section B

Special Requirements

Scientific calculator

Additional Material (s)

None

DO NOT turn examination paper over until instructed to do so.

SECTION A

[40]

Question 1 - Compulsory

a) Consider the following forms of the Cobb-Douglas production function, $Y_i = \beta_1 X_{2i}^{\beta_2} X_{3i}^{\beta_3} e^{u_i}$ and $Y_i = \beta_1 X_{2i}^{\beta_2} X_{3i}^{\beta_3} u_i$.

i. Is it plausible to assume that both models are linear models? [4]

ii. Theoretically which is the right specification of the Cobb-Douglas production function? Why? [4]

iii. Which is the frequently used empirical form by researchers? And why? [2]

iv. What basic OLS assumption does the right specification of the model violate? And how best can this model be estimated? [2]

[10]

b) Define the following terms.

i. Binary data

ii. Count data

iii. Ordered data

iv. Categorical data

v. Numerical data

c) Suppose you wish to determine the factors that determine the employment sector preferences (Formal Public Sector, Formal Private Sector and Informal Private Sector) in Eswatini and you run obtain the results given in the below table.

Multinomial logistic regression — Number of obs = 2043; LR chi2(38) = 828.14; Prob > chi2 = 0.0000; Pseudo R2 = 0.2410

Log likelihood = -1303.781

	Formal Public Sector		Informal Private Sector	
	Coefficient	**Odds Ratio**	**Coefficient**	**Odds Ratio**
age	0.0521***	1.0534	0.0463***	1.0474
Administrative Region				
Manzini	-0.0436	0.9573	0.3787**	1.4604
Shiselweni	0.6267**	1.8714	0.2727	1.3135
Lubombo	-0.3187	0.7271	0.2042	1.2265
Geographic Location				
Urban	-0.9692***	0.3794	-0.8385***	0.4324
Marital Status				
Married	0.8247***	2.2812	0.5103***	1.6658
Widowed	-0.5322	0.5873	0.4636*	1.5898

Divorced	0.3264	1.3860	0.4403	1.5532
Household Position				
Head	0.4939**	1.6388	0.1172	1.1244
Educational Attainment				
Elementary	0.7453	2.1071	0.1633	1.1774
Highschool	2.1502***	8.5864	-0.7444***	0.4750
Vocational and College	3.4309***	30.9037	-1.7894***	0.1671
University	3.3563***	28.6834	-34.3019	1.27E-15
Industrial Classification				
Agriculture and mining	-2.7905***	0.0614	-0.5437	0.5806
Manufacturing	-2.8310***	0.0590	-0.2932	0.7459
Electricity and water	-0.6854	0.5039	-33.1531	4.00E-15
Construction	0.6803	1.9744	1.2305	3.4230
Wholesale, retail trade and hospitality industry	-3.5288***	0.0293	1.3061***	3.6920
Transportation and storage	-0.2749	0.7596	0.2183	1.2440
constant	-4.2101***		-2.3160***	

[4]

i. Evaluate the model [2]

ii. What is the base category? [8]

iii. Interpret the results for geographic location and educational attainment.

d) Compare and contrast between the Fixed Effects Model and the Error Components Model. [4]

SECTION B

ANSWER ANY TWO QUESTIONS

Question 2

a) Eloquently discuss the following model selection criteria, ensuring to compare each model selection criteria. [30]

i. R-square
ii. Adjusted R-Square
iii. AIC
iv. BIC
v. SIC
vi. Mallow's C criterion

Question 3

a) What is a structural break? [3]
b) What are the effects of disregarding the structural break? [2]
c) With the aid of an appropriate example discuss any two methods for detecting a structural break. [20]
d) What are the impacts of mis-specifying the error term? [5]

Question 4

Using an appropriate example, clearly detailing the scenario which you are trying to model and estimate, develop a panel data model under the following assumptions in tandem. [30]

- Assume that the intercept and slope coefficients are constant across time and space and the error term captures differences over time and individuals.
- The slope coefficients are constant but the intercept varies over individuals.
- The slope coefficients are constant but the intercept varies over individuals and time.
- All coefficients (the intercept as well as slope coefficients) vary over individuals.
- The intercept as well as slope coefficients vary over individuals and time.