WOMEN'S UNIVERSITY IN AFRICA

Addressing gender disparity and fostering equity in University Education

FACULTY OF AGRICULTURAL SCIENCES

MSc AGRIBUSINESS SYSTEMS MANAGEMENT AND DEVELOPMENT

MAIN PAPER

MASMD 124 : APPLIED ECONOMETRICS

INTAKE : FIRST YEAR SECOND SEMESTER

DATE : JANUARY 2021 TIME: 3HOURS

INSRUCTIONS TO CANDIDATES

Answer any four questions

1. a) Briefly discuss how you would choose amongst different functional forms that could be assumed by an empirical model. **[10]**

b) In empirical research the researcher, explain why the researcher should not only quote the sources of data but also state explicitly how the variables are measured. **[5]**

c) Consider the following regression model:

$$\frac{1}{Y_i} = \beta_1 + \beta_2 \left(\frac{1}{X_i}\right) + u_i$$

i. Explain whether this is a linear regression model, giving reason for your answer. **[2]**

ii. Explain the behaviour of Y as X tends to infinity. **[2]**

d) Consider the following regression model:

$$Y_i = \frac{e^{\beta_1 + \beta_2 X_i}}{1 + e^{\beta_1 + \beta_2 X_i}}$$

Show and explain whether this an intrinsically linear regression model, or intrinsically nonlinear regression model giving reason for your answer. **[6]**

2. With use of relevant equations, show the consequences of the following:

a) Including an irrelevant variable into the "true" regression model. **[10]**

b) Omitting a relevant variable from the "true" regression model. **[10]**

3. a) Discuss the problems associated with LPM. **[15]**

b) Explain the features of the Logit model. **[10]**

4. Under the theme "Proximate determinants of herbicides use by smallholder farmers in Zimbabwe", linear regression technique was used to ascertain the determinants of herbicide use by farmers. The dependent variable (Y) was the amount of herbicides used as an indicator of the level of adoption of modern control methods. The independent variables (X_i) were the principal socio-economic factors (sex, household size, education level, agricultural courses, farming objective, distance to extension, distance to input supply, land size, livestock ownership and knowledge of herbicides) selected by factor analysis. Different forms of regression namely linear, Cobb Douglas, exponential and semi-log were fitted on the data and the results were as follows:

Coefficients	Linear	Cobb Douglas	Exponential	Semi log
Constant	-2.287	-1.906	-0.118	-7.072
	(-1.21)	(-2-206)*	(-0.319)	(-1.319)
X_{sex}	-0.280	0.516	0.116	2.920
	(-0.142)	(1.047)	(0.355)	(0.936)
$X_{household\ size}$	-0.148	-0.117	-0.023	-0.785
	(-2.185)*	(-1.135)	(-2.067)*	(-1.226)
$X_{education}$	0.280	0.095	0.042	0.720
	(-3.572)**	(-2.204)*	(-3.015)**	(-2.683)**
$X_{agricultural\ course}$	0.456	0.028	0.012	0.828
	(0.907)	(0.168)	(0.145)	(0.803)
$X_{farming\ objective}$	-0.051	-0.465	-0.008	-3.506
	(-2.559)	(-3.231)**	(2.382)*	(-3.935)**
$X_{distance\ to\ extension}$	-0.041	0.131	-0.004	0.900
	(-0.687)	(1.048)	(-0.317)	(1.1370
$X_{distance\ to\ input\ supply}$	-0.046	-0.303	-0.018	-1.601
	(-0.691)	(-2.315)*	(-1.467)	(-1.933)
X_{land}	-0.072	-0.242	-0.009	0.124
	(-1.023)	(-1.907)	(-0.732)	(0.161)
$X_{livestock}$	4.552	0.206	0.598	1.423
	(5.688)**	(3.848)**	(4.513)**	(4.312)**
$X_{knowledge}$	0.215	1.455	0.037	7.294
	(8.582)**	(7.933)**	(8.847)**	(6.303)**
R^2	0.234	0.218	0.239	0.206
F	13.404**	10.386**	12.392**	10.064**

Determinants of use of herbicides by smallholder farmers

**t value was significant at 1%;

*t value was significant at 5%

(a) Which model will you use for this analysis and why? **[5]**

(b) Interpret and discuss the outcomes of your model choice. **[18]**

(c) What policy implications can you derive from this outcome? **[2]**

5. (a) Explain the nature of multicollinearity. **[4]**

(b) Briefly indicate whether multicollinearity is really a problem. **[6]**

(c) Describe the practical consequences of multicollinearity. **[6]**

(d) Describe how to detect multicollinearity. **[5]**

(e) Suggest some of the remedial measures can be taken to alleviate the problem of multicollinearity. **[4]**

6. (a) With reference to relevant examples, explain the different types of econometrics categories. **[6]**

(b) One of the problems with cross section data is heterogeneity. With reference to relevant examples explain the meaning of this statement. **[6]**

(c) Although plenty of data are available for economic research, discuss why the quality of the data is often poor. **[13]**

End of question paper