University of Sri Jayewardenepura
Faculty of Humanities and Social Sciences

Bachelor of Arts Fourth Year First Semester Examination
July /August- 2017
Economics
ECON 4160.03 – Applied Econometrics

Time: Three hours (03)
Answer any FOUR (04) questions. Calculators are permitted.
Each question carries equal marks.

1. Briefly interprite the following estimates related to regression analyses

    i. $R^2 = 0.677$ vi. Tollarane = .963

    ii. Rxy=0.458   vii. DW = 1.9

    iii. VIF = 1.039   viii. F = 46.99 (p = .012)

    iv. P = .000   ix. Standadized beta = 0.347

   v. Wald = 9.132   x. Confidence Interval (1.57 - 02.32)

(2 marks each)

2. Analyze each of the following outputs of hierarchical regression and report your results.

(20 Marks)

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age of the respondent	.107	290	.000	.955	290	.000
Experience in the business	.137	290	.000	.940	290	.000
Age of the firm	.149	290	.000	.936	290	.000

a. Lilliefors Significance Correction

1

Normal Q-Q Plot of Experience in the business
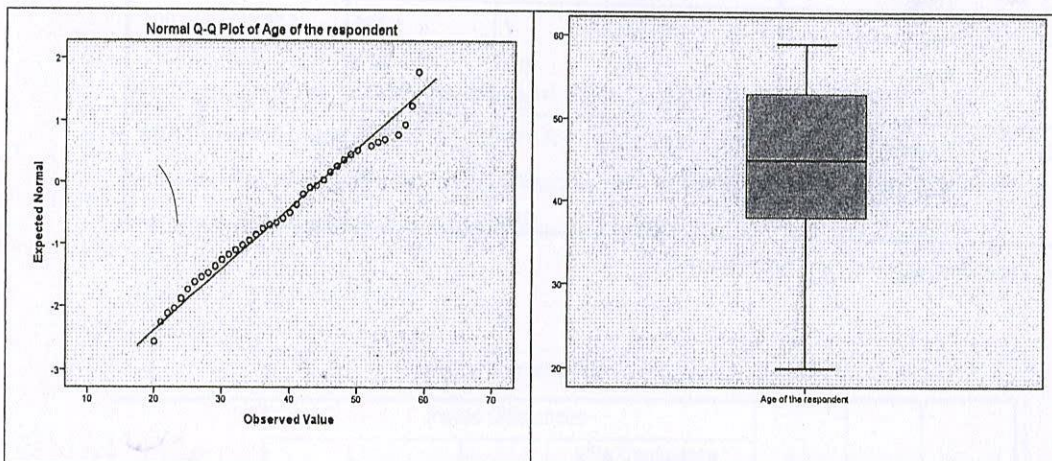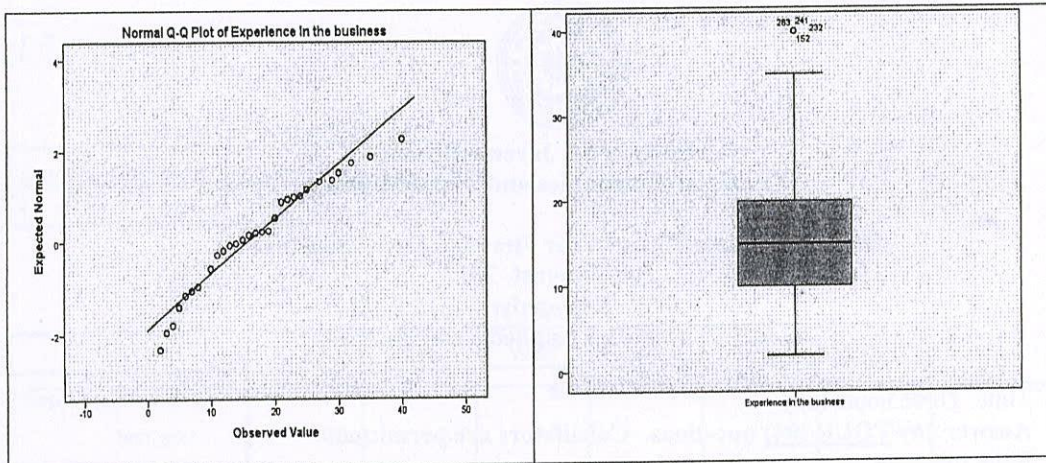
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.040[a]	.002	.009	.91604595
2	.181[b]	.033	.009	.90805237
3	.423[c]	.179	.152	.83960998

a. Predictors: (Constant), Marital status of respondent, Gender of the respondent, Age of the respondent

b. Predictors: (Constant), Marital status of respondent, Gender of the respondent, Age of the respondent, Age of the firm, Type of ownership, Edu_Level, Experience in the business

c. Predictors: (Constant), Marital status of respondent, Gender of the respondent, Age of the respondent, Age of the firm, Type of ownership, Edu_Level, Experience in the business, Eorientation, Market Orietation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1999.392	3	.131	.156	.006[b]
	Residual	40.994	286	.839		
	Total	240.387	289			
2	Regression	232.861	7	1.123	1.362	.001[c]
	Residual	7.526	282	.825		
	Total	240.387	289			
3	Regression	197.002	9	4.778	6.778	.000[d]
	Residual	43.385	280	.705		
	Total	240.387	289			

a. Dependent Variable: Fim Performance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.013	.423		-.031	.005		
	Age	.042	.076	.024	.382	.063	.917	1.091
	Gender	.008	.002	.003	-.048	.001	.917	1.091
	Marital status	-.133	.043	-.032	-.549	.003	.900	1.000
2	(Constant)	-.138	.553		-.249	.803		
	Age	.009	.008	.105	1.225	.002	.465	2.152
	Gender	-.016	.171	-.006	-.091	.007	.914	1.095
	Marital status	-.174	.141	.042	-.720	.002	.997	1.003
	Experience	-.011	.009	-.100	-1.182	.008	.479	2.088
	Edu_Level	-.071	.096	-.045	-.742	.000	.941	1.063
	ownership	.270	.098	.166	2.766	.006	.952	1.050
	Firm Age	-.005	.014	-.021	-.356	.722	.970	1.030
3	(Constant)	.146	.513		.284	.776		
	Age	.006	.007	.070	.874	.003	.453	2.207
	Gender	.027	.158	.010	.172	.004	.912	1.097
	Marital status	-.197	.223	-.048	-.881	.009	.993	1.007
	Experience	-.006	.009	-.059	-.747	.000	.476	2.100
	Edu_Level	-.097	.089	-.061	-1.093	.000	.939	1.065
	ownership	.166	.092	.102	1.815	.001	.927	1.079
	Firm age	-.003	.013	-.013	-.241	.810	.968	1.033
	Eorientation	.418	.060	.389	7.026	.000	.955	1.047
	Market Orietation	.084	.063	.075	1.329	.025	.930	1.075

a. Dependent Variable: Fim Performance

3. i. Briefly explain the data requirements of paired sample t test. (4 marks)

   ii. The following output reports English & Mathematics test scores for a sample of 400 students. Interprete the statistics reported in each column and report your results.

   (NOTE : Test variable = writing score; Grouping variable = Gender (M/F)

   (08 marks)

Paired Samples Test

	Paired Differences							
				95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
English - Math	17.30	9.50303	.4763	16.3608	18.2337	36.313	397	.000

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iii. interprite the following output and write your conclusions   (08 marks)

Group Statistics

	female	N	Mean	Std. Deviation	Std. Error Mean
write writing score	.00 male	91	50.1209	10.30516	1.08027
	1.00 female	109	54.9908	8.13372	.77907

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
write writing score	Equal variances assumed	11.133	.001	-3.734	198	.000	-4.86995	1.30419	-7.44183	-2.29806
	Equal variances not assumed			-3.656	169.70	.000	-4.86995	1.33189	-7.49816	-2.24073

4. I. Briefly explain the functional forms given and interprite regression coefficients.

   i. $\ln GDP = 6.9636 + 0.0269 time$

        SE   (0.015)   (0.00177)

   ii. $\ln Q \doteq 0.97 + 0.92 lnL + 0.12 lnK$

        SE   (0.30)   (0.04)

   iii. $GNP = 1.6329 + 258.4 lnMoney\ supply$

        SE   (122.9)

                                                     (05 marks each)

   II. Explain the fuctional form of Philips curve using hypothetical estimates

                                                    (05 marks)

5. I. What is the research situation of logistic regression ? Explain

                                                    (02 marks)

   II. A researcher who intend to analyze the causes of poverty, collected household data on income, consumption expenditure, assets, demographic and socio economic factors. How do you construct

       i. a multiple regression model

       ii. a logistic regression model

(NOTE : clearly state the model outcomes of each situation)   (08 marks)

III. The following model has been formulated to examine the factors affecting on owing/buying a second car by urban households. Interprete the given outputs and write results. What are your conclusions ?

$$L = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

$X_1 = household\ size; \quad X_2 = education\ level\ of\ HHH$

$X_3 = HHhead\ occupation\ (gvt = 1; Otherwise = 0)$

$X_4 = household\ income$

(10 marks)

Classification Table[a,b]

			Predicted		
			Seond_car		
	Observed		.00	1.00	Percentage Correct
Step 0	Second_car	.00	13315	0	70.0
		1.00	11668	0	30.0
	Overall Percentage				88.9

a. Constant is included in the model.
b. The cut value is .500

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	90.480	4	.000
	Block	90.480	4	.000
	Model	90.480	4	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	10376.017[a]	.116	.112

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	55.686	8	.000

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	hh_size	-.011	.015	.593	1	.441	.989
	hhh_edu	-.022	.007	8.879	1	.003	.978
	hhh_emp	.165	.023	50.260	1	.000	1.179
	hh_income	.000	.000	36.006	1	.000	1.000
	Constant	-2.436	.121	407.300	1	.000	.088

a. Variable(s) entered on step 1: hh_size, hhh_edu, hhh_emp, hh_income.

6. Write short notes
    i. Principal component analysis
    ii. Hosmer ang Lemeshow test
    iii. Methods of testing normality
    iv. Heteroscedasticity

(05 marks each)

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