MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF MASTER OF ARTS IN ECONOMICS

CITY CAMPUS

AEC 805: ECONOMETRICS

Date: 3rd December, 2016 Time: 9.00 - 12.00 noon

INSTRUCTIONS:

- Answer question ONE and any other THREE questions.

Question One (Compulsory)

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a) Econometrics is the life of an economist, discuss the goals of econometrics (6 marks)

b) From EVIEWS, the multiple regression result is presented as follow:

Dependent Variable: S
Method: Least Squares
Date: 02/28/02 Time: 10:04
Sample: 1 38
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.223923	1.935467	4.765736	0.0000
T	-0.786568	0.590256	-1.332588	0.1918
E	7.906074	3.660143	2.160045	0.0381
P	0.000408	0.000495	0.823516	0.4161
H	-0.018971	0.002674	-7.094425	0.0000

R-squared	0.709460	Mean dependent var	8.438421
Adjusted R-squared	0.674243	S.D. dependent var	2.621777
S.E. of regression	1.496382	Akaike info criterion	3.766057
Sum squared resid	73.89229	Schwarz criterion	3.981529
Log likelihood	-66.55509	F-statistic	20.14541
Durbin-Watson stat	2.146911	Prob(F-statistic)	0.000000

i) Your friend expects the coefficient of **P** to be positive. Carry out the formal hypothesis statement, test the hypothesis by using the 5% level of significance, and make your conclusion. (4 marks)

ii) Your friend also argues that every car at least should have 8.5 units of drag for safety in the road. Construct the confidence interval for the coefficient of **E**, carry out the hypothesis statement and test by using the 1% level of significance and make your conclusion. (4 marks)

iii) Explain why you need to use the F test. What is your conclusion from the F hypothesis test? (5 marks)

iv) How would the estimated results have differed in the coefficients, R^2 and t-statistics if you divided the variable **P** by 100? (5 marks)

ion Two

Question Two

(a) State the assumptions essential for the ordinary least square estimators to be BLUE. (N/B: Be sure to explain where your assumptions are used in "BLUE"). (5 marks)

(b) In the regression $Y_i = \beta_1 + \beta_2 X_i + u_i$, suppose you multiple each X_i value by a constant, say 5. Will it change the residuals and fitted values of Y_i? Briefly explain. (7 marks)

Question Three

a) Prove that; $r_{xy}^2 = \hat{b}_1^2 \frac{\sum x^2}{\sum y^2}$ (4 marks)

b) What are the major differences of the properties between the normal regression model with constant term and the non-intercept regression model? (8 marks)

Question Four

a) What is heteroscedasticity in econometrics estimation? Discuss the problem that the presence of heteroscedasticity causes for OLS estimator? (4 marks)

b) What problem does the presence multicollinearity cause for the OLS estimator? Explain the likely indicators of multicollinearity in OLS estimation (8 marks)

Question Five

a) Explain what is meant by a distributed lag model. Write the equation for a general distributed lag model with an infinite number of lags and for one with k lags. (6 marks)

b) Assume a two variable model of the form $Y_t = b_0 + b_1 X_t + u_t$ and that the error term follows the $AR(1)$ scheme that is $u_t = \rho u_{t-1} + v_t$, $-1 < \rho < 1$ where v_t satisfies the usual OLS assumption and ρ is known. Transform the model so that the error term is serially independent. (6 marks)

Question Six

Question Six

The following two equations represent a simple macroeconomic model.

$M_t = a_0 + a_1 Y_t + u_{1t}$
$Y_t = b_0 + b_1 M_t + b_2 I_t + u_{2t}$

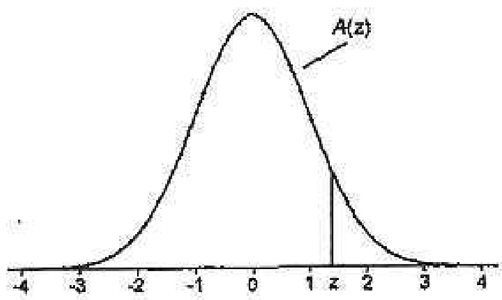
Where M_t is money supply is in time period t, Y_t is income and is I_t is investment.

Required:

a) Why is this a simultaneous equations model? Explain.
b) Find the reduced-form equation corresponding to the structural equations
c) Why these are reduced form equations important and what do the reduced form coefficients measure in this market model. (12 marks)

TABLE A.1

Cumulative Standardized Normal Distribution



$A(z)$ is the integral of the standardized normal distribution from $-\infty$ to z (in other words, the area under the curve to the left of z). It gives the probability of a normal random variable not being more than z standard deviations above its mean. Values of z of particular importance:

z	$A(z)$	
1.645	0.9500	Lower limit of right 5% tail
1.960	0.9750	Lower limit of right 2.5% tail
2.326	0.9900	Lower limit of right 1% tail
2.576	0.9950	Lower limit of right 0.5% tail
3.090	0.9990	Lower limit of right 0.1% tail
3.291	0.9995	Lower limit of right 0.05% tail

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999							