KJ SOMAIYA INSTITUTE OF MANAGEMENT STUDIES & RESEARCH
VIDYAVIHAR (E), MUMBAI- 400 077

PGDM/ IB/ RM/ COM/ MMS: VI -2016-18

ECONOMETRICS
(End trimester Examination)

April 11th, 2018

Max. Marks: 50

Duration: 3 Hrs.

Note:

Answer any **FIVE** of the following questions. All questions carry equal marks.

1. State and discuss the following OLS assumption and its consequences of violation, detection, and remedial measures.

    $Var(u_i)=\sigma^2$ for all i.

2. Consider the following equation aimed at estimating the demand for real cash balances in Mexico (standard errors in parentheses):

    $$lnMt = 2.00 - 0.10lnRt + 0.70lnYt + 0.60lnMt\text{-}1$$

    $$(0.10)\ (0.35)\ (0.10)$$

    $$R^2 = .90 \qquad DW = 1.80 \qquad N\ 26$$

    Where: Mt= the money stock in year t (millions of pesos)
    Rt= the long-term interest rate in year t (percent)
    Yt = the real GNP in year t (millions of pesos)

    Analyze the following questions with the help of the above estimated equation:
    a. What economic relationship between Y and M is implied by the equation?
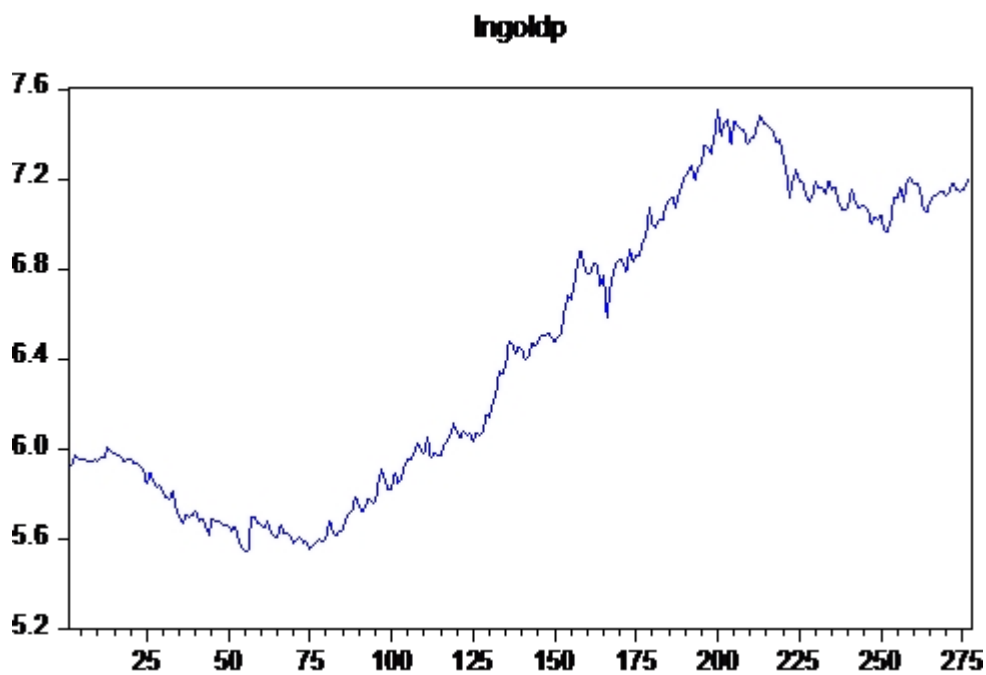   b. How are Y and R similar in terms of their relationship to M?

c. Does this equation seem likely to have serial correlation? Explain.

3. Explain with suitable example the concept of multi-collinearity. What are the consequences and various ways to correct for this problem?

4.

    a) Write the properties and assumptions of a time series data set? Which tests are used to examine unit root in financial data series?

    b) Interpret the following graph.

lngoldp

5. Write short notes on the following terms with suitable examples.

    a. Time series Model
    b. Auto regressive process
    c. Unit Root

6. Write interpretation of the following output in detail.

Dependent Variable: GOLDPRICEDOLLARS
Method: Least Squares
Date: 03/28/18   Time: 17:04
Sample (adjusted): 1 277
Included observations: 277 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61.75554	28.01436	2.204425	0.0283
@TREND	5.162096	0.175646	29.38914	0.0000

R-squared	0.758501	Mean dependent var	774.1248	
Adjusted R-squared	0.757623	S.D. dependent var	474.8098	
S.E. of regression	233.7574	Akaike info criterion	13.75364	
Sum squared resid	15026693	Schwarz criterion	13.77980	
Log likelihood	-1902.879	Hannan-Quinn criter.	13.76414	
F-statistic	863.7218	Durbin-Watson stat	0.040715	
Prob(F-statistic)	0.000000			

Dependent Variable: LNGOLDP
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 03/28/18   Time: 17:06
Sample (adjusted): 2 277
Included observations: 276 after adjustments
Failure to improve likelihood (non-zero gradients) after 71 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
$Q = C(4) + C(5)*(Q(-1) - C(4)) + C(6)*(RESID(-1)^2 - GARCH(-1))$
$GARCH = Q + C(7) * (RESID(-1)^2 - Q(-1)) + C(8)*(GARCH(-1) - Q(-1))$

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	5.062695	0.421673	12.00622	0.0000
@TREND	0.008114	0.002058	3.943348	0.0001
AR(1)	0.985531	0.000501	1968.372	0.0000

Variance Equation				
C(4)	0.005169	0.000766	6.751269	0.0000
C(5)	0.996123	8.09E-05	12319.18	0.0000
C(6)	-0.033967	0.012893	-2.634595	0.0084
C(7)	0.099602	0.082777	1.203258	0.2289

C(8)	-0.072297	0.711280	-0.101643	0.9190

R-squared	0.995000	Mean dependent var	6.450501
Adjusted R-squared	0.994963	S.D. dependent var	0.650208
S.E. of regression	0.046145	Akaike info criterion	-3.415327
Sum squared resid	0.581322	Schwarz criterion	-3.310388
Log likelihood	479.3152	Hannan-Quinn criter.	-3.373217
Durbin-Watson stat	2.219096		

Inverted AR Roots   .99

Q7. Discuss the following output in terms of time series models

Null Hypothesis: LNGOLDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=15)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.288622	0.9234
Test critical values: 1% level	-3.453910	
5% level	-2.871806	
10% level	-2.572313	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGOLDP)
Method: Least Squares
Date: 03/28/18   Time: 17:08
Sample (adjusted): 2 277
Included observations: 276 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGOLDP(-1)	-0.001242	0.004302	-0.288622	0.7731
C	0.012630	0.027869	0.453204	0.6508

R-squared	0.000304	Mean dependent var	0.004627
Adjusted R-squared	-0.003345	S.D. dependent var	0.046247

S.E. of regression	0.046324	Akaike info criterion	-3.299078
Sum squared resid	0.587989	Schwarz criterion	-3.272843
Log likelihood	457.2727	Hannan-Quinn criter.	-3.288550
F-statistic	0.083303	Durbin-Watson stat	2.223159
Prob(F-statistic)	0.773089		

Q8. Interpret the following output

Dependent Variable: LNGOLDP
Method: Least Squares
Date: 03/28/18   Time: 17:11
Sample (adjusted): 2 277
Included observations: 276 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.095070	0.053407	1.780125	0.0762
@TREND	0.000144	7.95E-05	1.806769	0.0719
LNGOLDP(-1)	0.982881	0.009776	100.5366	0.0000

R-squared	0.995002	Mean dependent var	6.450501
Adjusted R-squared	0.994966	S.D. dependent var	0.650208
S.E. of regression	0.046134	Akaike info criterion	-3.303718
Sum squared resid	0.581041	Schwarz criterion	-3.264366
Log likelihood	458.9131	Hannan-Quinn criter.	-3.287927
F-statistic	27176.08	Durbin-Watson stat	2.214289
Prob(F-statistic)	0.000000		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.108634	Prob. F(2,271)	0.1234
Obs*R-squared	4.229262	Prob. Chi-Square(2)	0.1207

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 03/28/18   Time: 17:12
Sample: 2 277
Included observations: 276
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.024451	0.054635	-0.447539	0.6548
@TREND	-3.33E-05	8.10E-05	-0.410744	0.6816
LNGOLDP(-1)	0.004506	0.010005	0.450388	0.6528
RESID(-1)	-0.118667	0.061678	-1.923988	0.0554
RESID(-2)	-0.059676	0.061495	-0.970429	0.3327

R-squared	0.015323	Mean dependent var	-6.87E-16
Adjusted R-squared	0.000789	S.D. dependent var	0.045966
S.E. of regression	0.045948	Akaike info criterion	-3.304667
Sum squared resid	0.572138	Schwarz criterion	-3.239080
Log likelihood	461.0441	Hannan-Quinn criter.	-3.278348
F-statistic	1.054317	Durbin-Watson stat	1.997292
Prob(F-statistic)	0.379591		

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