LONDON metropolitan university

EXAMINATION QUESTION PAPER: Reassessment, 2014

Module code:	**EC5003**
Module title:	**Introduction to Econometrics**
Module leader:	**Abay Mulatu**

Date:	**July/August 2014**
Duration:	**3 hours**

Exam type:	**Part Seen/Unseen, Closed**
Materials supplied:	**Statistical tables: the Student's *t* distribution, the *F* distribution, the *Chi*-Squared distribution and the Durbin-Watson statistic**
Materials permitted:	**Calculator**
Warning:	**Candidates are warned that possession of unauthorised materials in an examination is a serious assessment offence.**

Instructions to candidates:	**Candidates will be required to answer Question 1 in Part A and THREE out of the six questions in Part B.** **Each question carries an equal weight of 25%.** **DO NOT TURN PAGE OVER UNTIL INSTRUCTED**

PART A [Seen]

1. The following model of the determinants of salary is estimated by Ordinary Least Squares (OLS) using data on 447 executives of Fortune 500 companies:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + u_i$$

The variables are defined as follows. Y: salary of CEO in US $; X_1: the number of years as CEO (0 if less than six months); X_2: age of CEO; X_3: sales revenue of the company in 1998; X_4: profits of the company in 1998; X_5: total assets of the company in 1998. Below are EViews output.

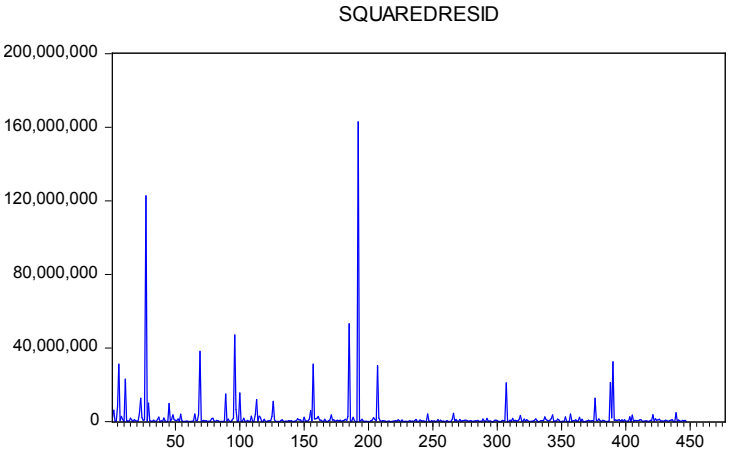
Dependent Variable: SALARY
Method: Least Squares
Date: 03/19/14 Time: 14:46
Sample (adjusted): 1 447
Included observations: 447 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1047.836	625.8599	1.674233	0.0948
TENURE	30.43616	9.486865	3.208243	0.0014
AGE	6.218495	11.50334	0.540582	0.5891
PROFITS	0.234410	0.053903	4.348750	0.0000
ASSETS	0.008349	0.001289	6.479275	0.0000

R-squared	0.240881	Mean dependent var	2027.517
Adjusted R-squared	0.234011	S.D. dependent var	1722.566
S.E. of regression	1507.604	Akaike info criterion	17.48555
Sum squared resid	1.00E+09	Schwarz criterion	17.53144
Log likelihood	-3903.021	Hannan-Quinn criter.	17.50364
F-statistic	35.06350	Durbin-Watson stat	2.021494
Prob(F-statistic)	0.000000		

a. Interpret the estimated coefficients. A couple of lines per estimated coefficient should be enough. [3 marks]

b. Below is a plot of the residuals from the above regression. Do you suspect the presence of heteroscedasticity? Explain. [3 marks]



c. What are the potential sources of heteroscedasticity? [3 marks]

d. Provide an intuitive explanation as to why OLS estimators would be inefficient in the presence of heteroscedasticity. [6 marks]

e. Below are reported two sets of EViews results of White's test for heteroscedasticity. What is your conclusion? Carefully set out the hypotheses and the decision rule in each case. [10 marks]

With Cross terms

Heteroskedasticity Test: White

F-statistic	2.124780	Prob. F(14,432)	0.0099
Obs*R-squared	28.79688	Prob. Chi-Square(14)	0.0111
Scaled explained SS	331.0907	Prob. Chi-Square(14)	0.0000

Without Cross terms

Heteroskedasticity Test: White

F-statistic	1.545308	Prob. F(4,442)	0.1881
Obs*R-squared	6.164939	Prob. Chi-Square(4)	0.1872
Scaled explained SS	70.88108	Prob. Chi-Square(4)	0.0000