UNIVERSITY OF CAMBRIDGE
Judge Business School

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Contest Quiz 7

Question Sheet

NOTE: Use the full data set unless stated otherwise. Please round your results to two decimal places. Do not round any interim results.
EXAMPLE: If your unrounded solution is 0.13897439, drop all decimal places except the first three. This leaves you with 0.138. If the third decimal place is 5 or above (as is the case here), round up. This gives 0.14.

Question 1

Load the bank1.txt data set into EViews or RExcel from the url:
http://thiloklein.de/R/bank

We are interested in describing the salaries in a US bank based on employees' education, beginning salary, gender, minority and category of job (include dummy variables jobcat2 and jobcat3 when jobcat=2 and 3 respectively). Run the regression:

$$salary_i = \beta_0 + \beta_1 educ_i + \beta_3 salbegin_i + \beta_4 male_i + \beta_5 minority_i + \beta_6 jobcat2_i + \beta_5 jobcat3_i + u_i$$

I) Produce a plot of residuals against fitted values. Is there a evidence of possible heteroskedasticity?
(a) Yes (b) No

II) Perform a Breusch-Pagan Test for heteroskedasticity. What is the value of the BP test statistic?
(a) 60.28 (b) 74.32 (c) 43.87 (d) 10.73

III) Perform a White Test for heteroskedasticity. What is the p-value?
a) 0.03 (b) 0.57 (c) 0.00 (d) 0.24

IV) Do you believe that there is heteroskedasticity?
(a) Yes (b) No
Continue exercise using robust-standard errors if heteroskedasticity is present.

V) What is the F-statistic for the null hypothesis that the coefficient of minority is equal to zero?

VI) Perfom a Jarque-Bera Test for normality. What is the JB-value?
(a) 11.11 (b) 7310.74 (c) 1459.31 (d) 438.23

VII) Are there any outliers?
(a) Yes (b) No

Question 2

Rerun above equation by transforming the variable salary and salbegin by a log function.

I) Produce a plot of residuals against fitted values. Have we mitigate the problem of heteroskedasticity compare to question 1?
(a) Yes (b) No

II) Compare the robust standard errors (s.e.) of this model with the one in question 1
(a) Same (b) New s.e. are lower than before (c) New s.e. are smaller than before

III) Use the White test to test for heteroskedasticity. Do we reject the null of homoskedasticity in residuals (10%significance level)?
(a) Yes (b) No
Use robust standard errors.

IV) What is the p-value of F-statistic for the null hypothesis that the coefficient of minority is equal to -0.08?
(a) 0.67 (b) 0.65 (c) 0.45 (d) 0.63

V) Based on R^2 is the fit of the this model better compared to question 1?
(a) Yes (b) No

VI) Do we solve the problem of non-normality in residuals by introducing the log transformations?
(a) Yes (b) No

VII) a) By consider an outlier an observation with an absolute residual greater than 2 the standard error of the regression (residual standard error) how many outliers are there?
(a) 0 (b) 2 (c) 3 (d) None of the above

VIII) By including a dummy variable in the regression above for the observation with idnumber=218, find the t-statistic of the new variable (use robust standard errors)