UNIVERSITY OF CAMBRIDGE
Judge Business School

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Econometrics I, Workbook 1

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- Answer all questions in no more than 5 pages. Please be brief. There is no credit at all for extended answers.
- Please ensure your submission is printed legibly on A4 paper, using one side of the paper only, in 12-point type, with at least one and a half spacing and with margins of at least 2.5 cm.
- The weighting of Workbook 1 is half of the total for this term's Econometrics module.
- The figure in square brackets after each question is the weight carried in Workbook 1.
- Documentation of your analysis: Your empirical analysis must be capable of being replicated. For this reason, you should annotate and include your *RExcel* script or *EViews* programme (or batch file in any other statistical package that you prefer to use) in the appendix. If you use packages that do not have batch command facility, you should report the sequence of your computational steps, such as data transformations etc in the appendix. This document / your batch file / your *RExcel*/*EViews* script file) should be printed and attached as the **only** appendix.
- Note: http://www.intranet.jbs.cam.ac.uk/students/plagiarism.html
- Please submit your assignment in the usual way: one paper copy including cover page to be placed in assignment box + electronic copy on Camtools, by 12 December at 2pm. Late submissions will be penalised according to MFin handbook.

Exercise 1

Use data on learning outcomes in file *learn.csv*. *GPA* and *SAT* are the scores in two different tests for admission to *CJBS*. We have information for 10 students.

(i) Scatterplot *GPA* and *SAT*. Regress *GPA* on *SAT* and a constant. Interpret the results.

(ii) Perform significance test (at 5%) on constant and *SAT*.

(iii) Construct a 95% confidence interval for the *SAT* coefficient.

(iv) If a student has a *SAT* of 5.5, what is the expected (predicted) *GPA*? What is the confidence interval for this expected *GPA*?

[40%]

Exercise 2

Use *coffee.csv*. This data includes information about weekly coffee sales and related variables.

quantity	units of coffee sold
price	coffee price
A	1 in weeks with advertisement, 0 otherwise.

Run the regression:

$$log(quantity) = c + \beta_1 log(price) + \beta_2 A + error$$

(i) Test whether advertisement has a significant effect on sales.

(ii) Test $H_0 : \beta_1 = -1$ against $H_a : \beta_1 < -1$. Interpret the results.

(iii) Test the joint significance of the variables included in the model. Is this a good model to explain *log*(*quantity*)? Justify your answer.

[30%]

Exercise 3

Use *dataex3.csv*.

(i) Scatterplot X and Y. Regress Y on X (include a constant). Plot the residuals. What can you conclude from this analysis of the data?

(ii) Create the variable X^2 and scatterplot it against Y. Compare this scatterplot with the previous one and comment.

(iii) Estimate a regression including as regressors, a constant, X and X^2. What can you conclude in terms of the "true" model?

[30%]