Chulalongkorn University: MABE *Chairat Aemkulwat*
Quantitative Methods in Economic Analysis *1st Term, 2015*

Homework 1

Due: Saturday, October 17, 2015, 9:30 hours to our staff. You have to submit homework in class **before 10:00 A.M.** Late homework will not be accepted.

Instruction: Answer all questions. Homework must be handwritten. Nevertheless, when asking to use Eviews, you have to answer by copying results from Eviews and pasting in Word from which you get a computer print-out. Credit will not be given to photocopying or duplication of files.

I. The data set, hw1_MBA_excel, contains information on annual average starting pay for MBA graduates of 30 well-regarded business schools in the USA for the Year 1994. Let

ASP be average starting pay in dollars ($),
GPA be GPA scores,
GMAT be GMAT scores, and
tuition be annual tuition fee in dollars *($)*

for MBA Graduates. (Hint: before using Eviews, check the excel file for the *start and end observations*, *upper-left data all*, and *number of series*)

1. Use Eviews to find the correlation and covariance between *ASP* and *tuition*. Explain their similarities and differences? What are the formulas for these two summary statistics?
2. Use Eviews to draw the scattergram to study the effect of *tuition* on *ASP*. By eyeballing, do you think we have a good fitted model? Make sure that *ASP* is on the vertical axis and *tuition* is on the horizontal axis.
3. Use Eviews to estimate the following bivariate regression model

$$ASP = \beta_0 + \beta_2 tuition + u.$$

   A. Report your results in our usual form.
   B. Interpret the intercept and the slope coefficient. Does annual tuition have any relationship with *ASP*? How do you know? If there is a positive relationship between the two, does that mean it pays to go to the highest-cost business school? Can you argue that a high-tuition business school means a high-quality MBA program? Why or why not.
   C. How much the variation in *ASP* for these n observations is explained by *tuition*? Does this simple regression necessarily capture a causal relationship between *ASP* and *tuition*? Explain
   D. Find the elasticity of *ASP* with respect to *tuition*. Interpret your result.
4. Use Eviews to find out whether *GMAT* has any effect on *ASP* in a bivariate regression. What happens when GMAT increases by 10 points?
5. Use Eviews to find out whether *GPA* has any effect on *ASP* in a bivariate regression model. How would you interpret the slope coefficient?

II. Using the same data set in Question I. Consider the following simple regression model:

(II.1) $ASP = \beta_0 + \beta_2 \log(tuition) + u$

1. Use Eviews to generate a new series whose values are the logarithm of *tuition*. Let name it *ltuition*. (Hint: in the *Eviews window*, choose **Quick/Generating Series**. Then, type in "ltuition = log(tuition)").
2. Use Eviews to estimate the bivariate regression of the equation (II.1) using two approaches: use new series, *ltuition* and use the old series, *tuition*. (Hint: for the latter approach, in the *"Equation Specification" box*, type in *ASP c log(tuition)*. Note that log(*tuition*) is the logarithm function of *tuition*.) Report the result in the equation form. Interpret the slope coefficient.
3. Let Y=ASP and X=*tuition*. Show algebraically why you have to divide the slope coefficient by 100 in interpreting the effect of *tuition* on *ASP*.
4. Suppose the exchange rate is 40 baht per dollar. Let Y*=*ASPbaht* be the average salary pay in baht. Show how to derive the new sample regression equation. Report the new numerical results in our usual form. Explain which estimates do change and which do not change when comparing to corresponding values obtained from running the regression in (II.1).
5. Suppose the exchange rate is 40 baht per dollar. Let *X**=*tuitionbaht* be the tuition in baht. Show how to derive the new sample regression equation. Report the new numerical results in an equation form. Explain which estimates do change and which do not change when comparing to corresponding values obtained from running the regression in (II.1).
6. Use Eviews to estimate sample regression equations in #5 and #6.