EE 325 HW 4 (Submit the answers for question 1-3 on Dec 2nd, 2011)

1. From the data for 46 states in the United States for 1992, Baltagi obtained the following regression results

$$\widehat{\log C} = 4.30 - 1.34 \log P + 0.17 \log Y$$
$$se = (0.91) \quad (0.32) \quad (0.20)$$
$$\bar{R}^2 = 0.27$$

Where C = cigarette consumption, packs per year
P = real price per pack
Y = real disposable income per capita
and the figures in the parentheses are the estimated standard errors

   a. What is the elasticity of demand for cigarettes with respect to price? Is it statistically significant? If so, is it statistically different from 1?
   b. What is the income elasticity of demand for cigarettes? Is it statistically significant?

2. From the sample of 209 firms, Wooldridge obtained the following regression results:

$$\widehat{\log(salary)} = 4.32 + 0.280 \log(sales) + 0.0174 roe + 0.00024 ros$$
$$se = (0.32) \quad (0.035) \quad (0.0041) \quad (0.00054)$$
$$R^2 = 0.283$$

Where salary = salary of CEO
sales = annual firm sales
roe = return on equity in percent
ros = return on firm's stock

and the figures in the parentheses are the estimated standard errors

   a. Interpret the preceding regression taking into account any prior expectations that you may have about the sings of the various coefficients
   b. Which of the coefficients are individually statistically significant at the 5 percent level?
   c. What is the overall significance of the regression? Which test do you use?

3. Data on advertising impressions retained and advertising expenditure for a sample of 21 firms. Letting Y represent impressions retained and X the advertising expenditure, the following regressions were obtained:

$$\textit{Model I} \quad \hat{Y}_i = 22.163 + 0.3631 X_i$$
$$se = (7.089) \quad (0.0971)$$
$$r^2 = 0.424$$
$$\textit{Model II} \quad \hat{Y}_i = 7.059 + 1.0847 X_i - 0.0040 X_i^2$$
$$se = (9.986) \quad (0.3699) \quad (0.0019)$$
$$R^2 = 0.53$$

   a. Interpret both models
   b. Which is a better model? Why?
   c. Which statistical test(s) would you use to choose between the two models?
   d. Are there "diminishing returns" to advertising expenditure, that is, after a certain level of advertising expenditure (the saturation level), does it not pay to advertise? Can you find out what the level of expenditure might be?

Empirical exercise using STATA ☺☺

4. *Disposable income and personal savings* The Chow test was introduced to see if a structural change occurred within the data between the two time periods. Table 8.11 includes updated data containing the values from 1970-2005. According to the National Bureau of Economic Research, the most recent U.S. business contraction cycle ended in late 2001.

   a. Estimate both the model for the full dataset (years 1970-2005) and 1970-1981

   b. Using Chow test, determine if there is a significant difference between 1970-1981 and the full dataset.