Exercise 6

Problem 1

The file *stockton96.gdt* contains 940 observations on home sales in Stockton, CA in 1996.

a) Use least squares to estimate a linear equation that relates house price *PRICE* to the size of the house in square feet *SQFT* and the age of the house in years *AGE*. Interpret all the estimates.

b) Suppose that you own two houses. One has 1400 square feet; the other has 1800 square feet. Both are 20 years old. What price do you estimate you will get for each house?

c) Test the hypothesis that the size and the age of the house are important determinants of its price (separately as well as jointly

d) Using the Breusch-Pagan test for heteroscedasticity, test whether the model satisfies the homoscedasticity assumption by using the command for the BP test in Gretl.

e) Use the White test to test for heteroskedasticity.

f) What do you conclude regarding the heteroskedasticity? Does your conclusion depend on the choosing a specific test? Discuss also drawbacks of the BP and White tests.

g) Test the hypothesis that the size and the age of the house are important determinants of its price (separately as well as jointly). Hint: choose appropriate standard errors. Does your conclusion differ from part (c)?

Problem 2

Using the data in *cps4_small.gdt* estimate the following wage equation with least squares and heteroskedasticity-robust standard errors:

$$\ln(WAGE) = \beta_1 + \beta_2 EDUC + \beta_3 EXPER + \beta_4 EXPER^2 + \beta_5(EXPERxEDUC) + e$$

Report the results.

(b) Add MARRIED to the equation and re-estimate. Holding education and experience constant, do married workers get higher wages? Using a 5% significance level, test a null hypothesis that wages of married workers are less than or equal to those of unmarried workers against the alternative that wages of married workers are higher.

(c) Plot the residuals from part (a) against the two values of MARRIED. Is there evidence of heteroskedasticity?

(d) Plot the least squares residuals against EDUC and against EXPER. What do they suggest?

(e) Test for heteroskedasticity using a Breusch-Pagan test where the variance depends on EDUC, EXPER and MARRIED. What do you conclude at a 5% significance level?