Problem set 6

August 5th, 2011
practice questions on heteroskedastcity and endogeneity

Question 1

Consider the following model:

$savings_i = \beta_0 + \beta_1 income_i + \beta_2 age_i + \beta_3 children + u_i,$ where n=5000

Suppose you suspect the following form of heteroskedasticity:

$$Var(u_i | income_i, age_i) = \sigma^2(0.5 inocme_i + 2age_i^2)$$

(a) Does this form of heteroskedasticity makes sense? (i.e. does it have the desired properties?)

(b) How would you estimate this model? Write the estimable model explicitly and explain how you obtain each variable.

(c) Now suppose you do not know the form of heteroskedasticity. Explain in detail, how you would test for heteroskedasticity and how you would estimate your model to obtain unbiased and efficient estimates of your coefficients.

Question 2

Consider the attached Stata output.

(a) Does A5 hold in this model? Explain.

(b) If you concluded that A5 holds, comment briefly why do you think it is the case and what variable, if introduced into the model could lead to violation of A5.

(c) If you concluded that A5 does not hold, briefly comment on which variable(s) lead to heteroskedasticity and why.