Tutorial Questions - Week 4

Statistics and Econometrics

Question 1

Consider a model where the return to education depends upon the amount of work experience (and vice versa):

$$\log(wage) = \beta_0 + \beta_1 educ + \beta_2 exper + \beta_3 educ \cdot exper + u$$

1. What is the return to another year of education?
2. State the null hypothesis that the return to education does not depend on the level of *exper*. What do you think is the appropriate alternative?
3. Use the data in wage2.RData to test the null hypothesis in part 2 against your stated alternative.
4. Predict the expected wage for an average person with $educ = 12$ and $exper = 10$.

Question 2

Use the data from jtrain.RData for this exercise.

1. Consider the simple regression model

   $$\log(scrap) = \beta_0 + \beta_1 grant + u,$$

   where *scrap* is the firm scrap rate (percentage of failed assemblies or material that cannot be repaired or restored, and is therefore condemned and discarded), and *grant* is a dummy variable indicating whether a firm received a job training grant. Can you think of some reaons why the unobserved factors in u might be correlated with *grant*?
2. Estimate the simple regression model using the data for 1988. (You should have 54 observations) Does receiving a job training grant significantly lower a firm's scrap rate?
3. Now, add as an explanatory variable $\log(scrap_{87})$. How does this change the estimated effect of *grant*? Interpret the coefficient on *grant*. Is it statistically significant at the 5% level against the one-sided alternative $H_1 : \beta_{grant} < 0$?
4. Test the null hypothesis that the parameter on $\log(scrap_{87})$ is one against the two-sided alternative. Report the p-value for the test.
5. Repeats parts 3 and 4, using heteroskedasticity-robust standard errors, and briefly discuss any notable differences.