Homework # 4

Economics 113

Professor Spearot

Fall 2008

Due Friday, November 7th, in-class

Problem #1

Consider the following regression predicting wages,

$$\begin{aligned} \widehat{\log(wage)} &= \underset{(0.104)}{0.284} + \underset{(0.007)}{0.092}\,Educ + \underset{(0.0017)}{0.0041}\,Exper + \underset{(0.003)}{0.022}\,Tenure \\ obs &= 526,\ R^2 = 0.316 \end{aligned}$$

where *wage* is the respondent's wage at his or her current job, *Educ* is years of education beyond high school, *Exper* is the cumulative years in the workforce, and *Tenure* is years at the respondent's current job.

a. Please interpret the R^2 for this regression. Does R^2 tell us whether there is a causal relationship between the explanatory variables and wages?

b. Please test, at the 95% level, whether *Educ* is a signifcant determinant of the wage. Use a two-sided test. In addition, please interpret the coefficient on *Educ*.

c. I claim that for every year of additional experience, I receive a .5% increase in my wage. Can you reject my hypothesis at the 90% level?

d. Please list some omitted variables that might cause $E(u|x) = 0$ to be violated.

Problem #2

Consider the following regression examining average test scores and school characteristics,

$$\begin{aligned} \widehat{math10} &= \underset{(6.113)}{2.274} + \underset{(0.00010)}{0.00046}\,totcomp + \underset{(0.040)}{0.048}\,staff - \underset{(0.00022)}{0.0002}\,enroll \\ obs &= 408,\ R^2 = 0.0541 \end{aligned}$$

where *math*10 is the average school-level 10th grade math score, *totcomp* is the total compensation given to teachers, *staff* is the number of staff at the school, and *enroll* is total enrollment.

a. Other than needing the intercept for technical reasons, does the intercept tell us anything informative? Please interpret the intercept.

b. Please calculate a 95% confidence interval for the coefficient on *totcomp*. Is *totcomp* a significant determinant of math scores? Why is this plausible? What is an omitted variable that might help determine math scores and is likely correlated with *totcomp*.

c. Calculate the p-value for the coefficient on *staff*. Is this low enough to reject the hypothesis that *staff* has zero effect on test scores?