

1. Using the data in the file *CPS1985-NonLin.mtw* estimate the model(s) required to address the following questions. These are actual survey data collected in 1985 from 534 U.S. citizens. In answering the questions below, let us all assume that an individual's wage (\$/hour) is determined by her/his education (in years of schooling) and experience (in years):

$$Wage_i = \beta_0 + \beta_1 Ed_i + \beta_2 Ex_i + u$$

- a. Define each of the elements of the model above; i.e., what do *Wage*, *Ed*, *Ex*, *u*, β_0 , β_1 , and β_2 all represent? Explain what each is and what each means.
- b. Estimate the above model and interpret all parameter estimates.
- c. Do women earn lower starting salaries *and* lower raises? Specify a model that would allow you to address these two questions. Interpret all estimated parameters. In doing so, be sure to indicate which estimates are statistically different from zero.
- d. The question in part c is a joint hypothesis test. Specify the joint hypothesis and complete the test. What conclusion did you reach?
- e. Empirical evidence suggests that an individual's returns to experience (raises) are positive early in their career, but eventually decline. Thus, a graph that depicts one's wage profile over time would look like a "hill." Specify a model that will capture this **nonlinear effect of experience on wages**. Explain your model specification and what estimated parameter values you expect. Estimate the model and include a copy of your printout.
- f. Interpret the results. How do you interpret the effects of experience on wage?
- g. At what age are the returns to an additional year of experience the greatest?