

Econ 741 Homework 3

John Appert, Randall Chicolla, Andrea Franz

October 4, 2018

1 Question 1: Polynomials (Stata)

Lets see how income varies with age. First construct your sample. We will want to study individuals who are (inclusively) between 16 and 65 years of age, have positive earnings, and worked more than 1000 hours in a year. Pick a polynomial specification (of age) to run.

- a Present the results from your regression. (5 points)
- b Explain why you picked the specification you did. (6 points)
- c Give the marginal effect and teh average of the marginal effects. (4 points)
- d Discuss the significance of your polynomial overall as well as the individual terms. (4 points)

2 Question 2: Indicator Variables and Interactions (Stata)

Lets now see how earnings varies with marriage. Use the marst variable to create three indicator variables for whether people are a) never married b) currently married c) formerly married.

- a Put all three indicator variables into your model. Discuss the results. (6 points)
- b Run a model that will test whether or not married people see their wages go up more quickly with age than people who were never married. Discuss the results. (8 points)

3 Question 3: Functional Form (Stata)

Construct a variable that is years of education. Report and interpret (in one sentence each) the following coefficients with a model of earnings on education:

- a Linear-Linear (4 points)
- b Log-Linear (4 points)
- c Linear-Log (4 points)
- d Log-Log (4 points)

4 Question 4: Heteroskedasticity (Stata and R)

- a Is there evidence of heteroskedasticity based on age? Show me in a picture. Discuss. (12 points)

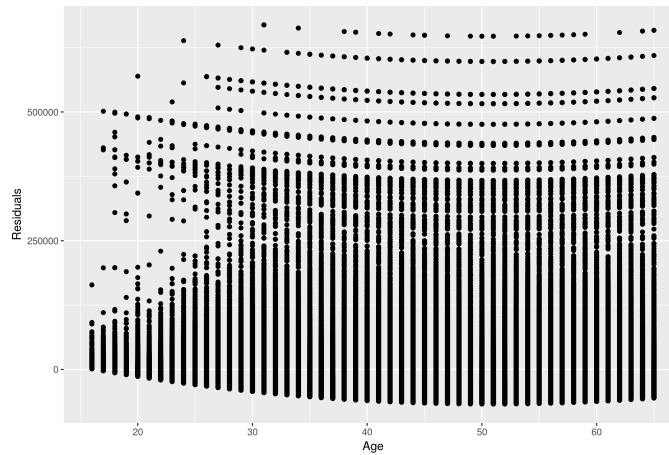


Figure 1: Residuals vs Age

- b Obtain robust standard errors in R and Stata. (18 points)

The values of the robust standard errors found in R were as follows:
With no adjustment for degrees of freedom:

Age: 23.6251
Age2: 0.3024647
Cons: 399.5719148

We adjusted these values for the degrees of freedom using:

$N/(N - k)$
Age: 23.625128
Age2: 0.302465
Cons: 399.572365

Using Stata we found the following values for robust standard errors:

Age: 23.62513
Age2: 0.302465
Cons: 399.5724