Professor Joyce Jacobsen

Economics 300
Summer 2010

Assignment #11

Due Thursday 7/1/10 by 6 p.m. in the Econ 300/QAC201 slot in the Economics Alcove

Please show the calculations used to arrive at your answers. Round final answers to the second decimal place if necessary.

A. Use of wage data in a text file and Stata to study wage determination.

1) The dataset cps07.txt contains 200 observations on randomly selected workers from the March 2007 Current Population Survey. This is a survey of over 50,000 households conducted monthly, and it serves as the basis for the national employment and unemployment statistics. Data are collected on a number of individual characteristics as well as employment status. This data extract contains information on four variables, stored in four columns in the following order:

    1) years of education
    2) 1 if person is female, 0 if male
    3) years of labor market experience
    4) natural logarithm of average hourly earnings (use as your dependent variable)

    Download this dataset from the course webpage and read these data into Stata.

2) Compare the simple regressions:

    earnings = a + b*(years of education)
    earnings = a + b*(years of experience)

    which is "better"? Explain your reasoning.

3) Now run the multiple regression:

    earnings = $b_0 + b_1$*(years of education) + b_2*(years of experience)

    What are the confidence intervals for b_1 and b_2? Is this regression "better" than either or both of the previous simple regressions? Explain your reasoning

4) Now create two new variables: the square of education and the square of experience. Run the multiple regression:

    earnings = $b_0 + b_1$*(years of education) + b_2*(years of experience)

    + b_3*(years of education)^2 + b_4*(years of experience)^2

    Compare the estimated payoff in terms of higher hourly earnings from an additional year of education from this equation to the payoff from the equation in **3**. Do the same for experience. Is this regression "better" than the one in **3**? Explain your reasoning.

A. 5) Run the multiple regression and print out the output and attach it to your problem set:

$$\text{earnings} = b_0 + b_1*(\text{years of education}) + b_2*(\text{years of experience})$$

$$+ b_3*(\text{years of education})^2 + b_4*(\text{years of experience})^2 + b_5*(\text{female})$$

How do we interpret the coefficient on female? Is this regression "better" than the one in **4**? Explain your reasoning. Can you think of an alternative specification to consider the effects of gender on hourly earnings that might be better to run? If so, run it and interpret its results.

6) What other variables might you want to include in an earnings equation besides these? Explain your reasoning.

B. Suppose a study of the U.S. demand for salmon gave the following regression:

$$\log Q = 3.25 - 0.80*(\log P) + 1.10*(\log I) - 0.50*(\log P_B)$$

Q = pounds demanded of salmon per capita per annum
P = price per pound of salmon
I = per capita income
P_B = price per pound of bagels

1) What is the elasticity of demand? Is salmon an ordinary or a Giffen good?

2) What is the income elasticity? Is salmon a normal or inferior good? If it is a normal good, is it a necessity or a luxury good?

3) What is the cross-price elasticity with respect to bagels? Is salmon a substitute or complement for bagels?

4) If price per pound of salmon increased by 20%, by how much would the quantity demanded of salmon change? What price increase per pound of bagels would be required to decrease the quantity demanded of salmon by 30%?

C. 24 observations on industrial output and inputs gave the regression (Lovell, see handout on regressions by Wesleyan professors):

$$\log Q = -4.160 + 0.232*(\log K) + 0.807*(\log L)$$

1) Estimate how much output increases if L increases by 15%, while K remains unchanged.

2) These data are from 1899-1922. As wage rates have increased, capital has been substituted for labor. Specifically, suppose it has been found that a 60% increase in capital has been associated with a 10% reduction in labor. Would output increase or decrease as a consequence? By how much?

3) Suppose both capital and labor increase by 15%. Would output increase by 15% too?