ECON 4706 B Winter 2020 Simon Power

Assignment 4: Due Date April 7

1. A researcher suggests that the following model might be useful for analyzing earnings

where

EARNINGS = current hourly earnings in $

S = years of schooling

EXP = total out-of-school work experience

ASVABC = composite IQ score, standardized to have a mean of 0, and a standard deviation of 1

MALE = gender of respondent (1 if male, 0 if female)

ETHBLACK = African-American (1 if African-American, 0 otherwise)

ETHHISP = Hispanic (1 if Hispanic, 0 otherwise)

a) Using the data from the EAWE22.dta dataset, together with the appropriate STATA commands, estimate the model. Cut and paste your output into your assignment.

b) Another researcher now comes along and wonders whether work experience with previous employer(s) is of equal value to a worker as work experience with current employer. In order to investigate this issue, estimate a new version of the model in which work experience, EXP, is divided into two parts, namely, work experience with previous employer(s), PREVEXP, and work experience with current employer, TENURE, where PREVEXP = EXP – TENURE. Cut and paste your output into your assignment.

NOTE: For parts c), d), and e), you may NOT use the STATA “test” or “lincom” commands.

c) Test to see whether the impact of work experience with previous employer(s) is equal to that of work experience with current employer, that is, test the null hypothesis against the alternative , using the basic t-test approach, which involves the use of information from the estimated variance covariance matrix. (See, for example, the discussion in the text around equation (6.31) on p. 283.) NOTE: Assume that is the parameter associated with PREVEXP and that is the parameter associated with TENURE.

d) Repeat part c) using the t-test reparameterization approach, described on the bottom half of p. 283. Explain.

e) Repeat part c) using the general F-test approach, described on pp. 281-282.

f) Check your answer to part e) by using the STATA “test” command. Cut and paste your output into your assignment.

g) Using your STATA output from part f), check your answers to parts c) and d). Explain.

h) A third researcher now comes along and argues that the important issue is not whether work experience with previous employer(s) is of equal value to a worker as work experience with current employer, rather it is whether work experience with previous employer(s) is of less value to a worker than work experience with current employer. Explain how the third researcher’s concern could be addressed, that is, tested, using a simple adaptation of the t-test reparameterization approach from part d), and then do it.

NOTE: For Question 2, you may NOT use the STATA “imtest” command.

2. Recall the hedonic price function model for 1987 house prices in Windsor, Ontario that we used in Question 2 of Assignment 3

where: = price (dollars), = lot size in square feet, = number of bedrooms, = number of bathrooms, = 1 if full basement present, = 0 otherwise.

a) Using the data in the Excel file housedata.xlsx, re-estimate this model and then test for heteroskedasticity using the (regular) White Test. Explain.

b) Repeat part a), but using a variation of the White Test, in which the squared residuals are just regressed on a constant, the original set of explanatory variables, and their squares, eliminating any duplicates or redundancies. Explain.

3. Recall the simple linear demand model for oranges from Question 3 in Assignment 2

where: Q = quantity of oranges (in pounds) sold on consecutive days and P = daily price (in cents per pound) of oranges. (The data is in the Excel file oranges.xlsx).

a) Test for heteroskedasticity using the Goldfeld-Quandt test, assuming that the heteroskedasticity, if any, is positively related to the value of the variable . (Omit the middle 2 observations.) Explain.

b) Repeat part a), but using a semi-logarithmic specification rather than a linear specification.

c) Which specification of the demand model for oranges, the linear or the semi-logarithmic, appears to be preferable in terms of homoskedasticity/heteroskedasticity. Explain.