POLS 6481, Spring 2021

Professor Scott Basinger

Reading Assignment week 12

Distributed Sunday, April 18

Due Thursday, April 22

Tuesday: Wooldridge 4.4 + 7.1 + 7.2a + 7.3; Hardy 7 – 12, 18 – 29

Thursday: Wooldridge 13.3 + 13.5 Appx 13A + 14.1 + 14.2 + Appx 14A

1. Suppose you estimate a model with one explanatory variable (*x*) and one dummy variable (*d*) such as:

Abstract Concrete example (using WAGE1.DTA)

*y* = *b*0 + *b*1*x* + *b*2*d* *wage* = 0.623 + 0.506 *educ* – 2.27 *female* (R2 = .259)

Suppose you changed the **base group** or **benchmark group** from one group to the other, using a new dummy variable whose value is *c* = 1–*d*, and instead estimating the model:

Abstract Concrete example

*y* = *β*0 + *β*1*x* + *β*2*c* *wage* = \_\_\_\_ + \_\_\_\_ *educ* ± \_\_\_ *male*

A. What would be the effect on the dummy variable’s coefficient? (Compare *b*2 to *β*2.)

B. What would be the effect on the control variable’s coefficient? (Compare *b*1 to *β*1.)

C. What would be the effect on the constant? (Compare *b*0 to *β*0.)

2. What is the equation for a *t* test of the difference between (or equality of) two regression coefficients? State both the numerator and the denominator (i.e., standard error of the difference).

3. What is the equation for a *t* test of a hypothesis regarding the sum of two regression coefficients?

State both the numerator and the denominator (i.e., standard error of the sum). You will need this for week 13 but for symmetry, please find it now.

4. How does first-differencing control for unobserved individual effects with panel data?

5. What problem will you encounter when you first-difference?

6. What is a *fixed effects* estimator?

6A. What is the primary advantage of fixed effects compared to first differencing?

6B. What is the primary disadvantage of adding fixed effects to a static regression model?

7. What is a *random effects* estimator?

7A. What is the primary advantage of random effects compared to fixed effects?

7B. What assumption will you have to make to use the fixed effects estimator?

8. What test would you use to decide between a *random effects* or a *fixed effects* estimator?

9. If you performed the test named in 8. and rejected the null hypothesis (i.e., observed a statistically significant test statistic), then should you use the *random* *effects* or *fixed effects* estimator?