File: Ch07, Chapter 7, Using Indicator Variables

Multiple Choice

1. The following Mincer equation has been used to estimate wages:
$\ln(Y) = \ln(Y_o) + \beta_2 EDU + \beta_3\ EXPER + \beta_4\ EXPER^2 + e$
where Y is income, Y_0 is income of someone with no education or experience, *EDU* is years of education and *EXPER* is experience in the field. If you suspect males earn higher wages than females and that the wage difference increases with education how would you adjust the econometric model to estimate wages?
a.) include a binary variable for gender, *MALE*
b.) include an interaction term equal to *MALE* EXPER*
c.) include an indicator variable for *MALE* and one for *FEMALE*
d.) include a binary variable for *MALE* and an interaction term equal to *MALE * EDU*

Ans: d

2. The Chow test is a specific application of a(n)
a.) z-test
b.) χ^2-test
c.) F-test
d.) t-test

Ans: c

3. A large company is accused of gender discrimination in wages. The following model has been estimated from the company's human resource information

ln(*WAGE*) = 1.439 + .0834 *EDU* + .0512 *EXPER* + .1932 *MALE*

Where WAGE is hourly wage, EDU is years of education, EXPER is years of relevant experience, and MALE indicates the employee is male. How much more do men at the firm earn, on average?
a.) $1.21 per hour more than females
b.) 19.32% more than females
c.) $19.32 per hour
d.) $19,320 more per year than females

Ans: b

4. A large company is accused of gender discrimination in wages. The following model has been estimated from the company's human resource information

ln(*WAGE*) = 1.439 + .0834 *EDU* + .0512 *EXPER* + .1932 *MALE*

Where WAGE is hourly wage, EDU is years of education, EXPER is years of relevant experience, and MALE indicates the employee is male. What hypothesis would you test to determine if the discrimination claim is valid?

a.) $H_0: \beta_{MALE} = 0$; $H_1: \beta_{MALE} \geq 0$
b.) $H_0: \beta_{MALE} = \beta_{EDU} = \beta_{EXPER} = 0$; $H_1: \beta_{MALE} \neq 0$ and $\beta_{EDU} \neq 0$ and $\beta_{EXPER} \neq 0$
c.) $H_0: \beta_{MALE} = \beta_{EDU} = \beta_{EXPER} = 0$; $H_1: \beta_{MALE} \neq 0$ or $\beta_{EDU} \neq 0$ or $\beta_{EXPER} \neq 0$
d.) $H_0: \beta_{MALE} \leq \beta_{EDU}$ or $\beta_{MALE} \leq \beta_{EXPER}$; $H_1: \beta_{MALE} > \beta_{EDU}$ or $\beta_{MALE} > \beta_{EXPER}$

Ans: a

5. If you perform a Chow test to compare two regressions and reject the null hypothesis, what should you conclude?

a.) there is not sufficient evidence that the regressions are significantly different
b.) the regression equations are statistically different
c.) the regression equations are equivalent
d.) it depends on how you set up the null hypothesis

Ans: b

6. Which of the following models measures the effects of all possible combinations of the characteristics of a sample with two dummy variables D_1 and D_2 on the variable y:

a.) $y = \beta_1 + \beta_2 D_1 + \beta_3 D_2 + \varepsilon$
b.) $y = \beta_2 D_1 + \beta_3 D_2 + \varepsilon$
c.) $y = \beta_1 + \beta_2 D_1 + \beta_3 D_2 + \beta_4 D_1 \times D_2 + \varepsilon$
d.) $y = \beta_1 + \beta_2 D_1 + \beta_3 D_1 \times D_2 + \varepsilon$

Ans: c

7. Consider the following regression model $y = \beta_1 + \beta_2 D + \beta_3 x + \beta_4 D \times x + \varepsilon$ where $D = 1$ if the observation has the property X. What hypothesis would you test to examine if the increase of variable x will increase y for the individuals with property X:

a.) $H_0: \beta_4 \leq 0, H_1: \beta_4 > 0$
b.) $H_0: \beta_3 \leq 0, H_1: \beta_3 > 0$
c.) $H_0: \beta_2 + \beta_3 \leq 0, H_1: \beta_2 + \beta_3 > 0$
d.) $H_0: \beta_3 + \beta_4 \leq 0, H_1: \beta_3 + \beta_4 > 0$

Ans: d

8. Consider the following regression model $y = \beta_1 + \beta_2 D + \beta_3 x + \beta_4 D \times x + \varepsilon$ where $D = 1$ if the observation has the property X. What hypothesis would you test to examine if property X increases the effect of x on y:

a.) $H_0: \beta_3 = 0, H_1: \beta_3 \neq 0$

b.) $H_0: \beta_3 \leq 0, H_1: \beta_3 > 0$
c.) $H_0: \beta_4 \leq 0, H_1: \beta_4 > 0$
d.) $H_0: \beta_3 + \beta_4 \leq 0, H_1: \beta_3 + \beta_4 > 0$

Ans: c

9. Consider the following regression model $y = \beta_1 + \beta_2 D + \beta_3 x + \beta_4 D \times x + \varepsilon$ where $D = 1$ if the observation has the property X. What hypothesis would you test to examine if property X has a significant impact on the regression model:
a.) $H_0: \beta_2 = 0, H_1: \beta_2 \neq 0$
b.) $H_0: \beta_4 \leq 0, H_1: \beta_4 > 0$
c.) $H_0: \beta_2 = 0, \beta_4 = 0, H_1: \beta_2 \neq 0 \text{ } or \text{ } \beta_4 \neq 0$
d.) $H_0: \beta_3 + \beta_4 \leq 0, H_1: \beta_3 + \beta_4 > 0$

Ans: c