

Hoja de Ejercicios 12

Variables Ficticias

Estadística-II. INTRODUCCIÓN a la ECONOMETRÍA. UC3M

1. (Ejercicio 7.10, Wooldridge (2003)) Use the data in WAGE2.RAW for this exercise.

- (i) Estimate the model

$$\log(\text{wage}) = \beta_0 + \beta_1 \text{educ} + \beta_2 \text{exper} + \beta_3 \text{tenure} + \beta_4 \text{married} + \beta_5 \text{black} + \beta_6 \text{south} + \beta_7 \text{urban} + u,$$

and report the results in the usual form. Holding other factors fixed, what is the approximate difference in monthly salary between blacks and nonblacks? Is this difference statistically significant?

- (ii) Add the variables exper^2 and tenure^2 to the equation and show that they are jointly insignificant at even the 20 % level.
- (iii) Extend the original model to allow the return to education to depend on race and test whether the return to education does depend on race.
- (iv) Again, start with the original model, but now allow wages to differ across four groups of people: married and black, married and nonblack, single and black, and single and nonblack. What is the estimated wage differential between married blacks and married nonblacks?
2. (Ejercicio 7.12, Wooldridge (2006)) Use the data in GPA2.RAW for this exercise.

- (i) Consider the equation

$$\text{colgpa} = \beta_0 + \beta_1 \text{hsize} + \beta_2 \text{hsize}^2 + \beta_3 \text{hsperc} + \beta_4 \text{sat} + \beta_5 \text{female} + \beta_6 \text{athlete} + u$$

where colgpa is cumulative college grade point average, hsize is size of high school graduating class, in hundreds, hsperc is academic percentile in graduating class, sat is combined SAT score, female is a binary gender variable, and athlete is a binary variable, which is one for student-athletes. What are your expectations for the coefficients in this equation? Which ones are you unsure about?

- (ii) Estimate the equation in part (i) and report the results in the usual form. What is the estimated GPA differential between athletes and nonathletes? Is it statistically significant?
- (iii) Drop sat from the model and reestimate the equation. Now what is the estimated effect of being an athlete? Discuss why the estimate is different than that obtained in part (ii).
- (iv) In the model from part (i), allow the effect of being an athlete to differ by gender and test the null hypothesis that there is no ceteris paribus difference between women athletes and women nonathletes.

- (v) Does the effect of *sat* on *colgpa* differ by gender? Justify your answer.
3. (Ejercicio 7.15, Wooldridge (2003)) Use the data in WAGE1.RAW for this exercise.
- (i) Use equation (7.18) to estimate the gender differential when $educ = 12,5$. Compare this with the estimated differential when $educ = 0$.
 - (ii) Run the regression used to obtain (7.18), but with $female(educ - 12,5)$ replacing $female * educ$. How do you interpret the coefficient on *female* now?
 - (iii) Is the coefficient on *female* in part (ii) statistically significant? Compare this with (7.18) and comment.