Hoja de Ejercicios 11
Variables Ficticias

Estadística-II. INTRODUCCIÓN a la ECONOMETRÍA. UC3M

1. (Ejercicio 7.1, Wooldridge (2003)). Using the data in SLEEP75.RAW (see also Problem 3.3), we obtain the estimated equation:

$$\begin{aligned} \hat{sleep} &= 3840{,}83 - 0{,}163totwrk - 11{,}71educ - 8{,}70age + 0{,}128age^2 + 87{,}75male \\ &\quad (235{,}22) \quad (0{,}018) \qquad (5{,}86) \qquad (11{,}21) \quad (0{,}134) \qquad (34{,}33) \\ &\quad n = 706, \quad R^2 = 0{,}123, \quad \bar{R}^2 = 0{,}117 \end{aligned}$$

The variable *sleep* is total minutes per week spent sleeping at night, *totwrk* is total weekly minutes spent working, *educ* and *age* are measured in years, and *male* is a gender dummy.

(i) All other factors being equal, is there evidence that men sleep more than women? How strong is the evidence?

(ii) Is there a statistically significant tradeoff between working and sleeping? What is the estimated tradeoff?

(iii) What other regression do you need to run to test the null hypothesis that, holding other factors fixed, *age* has no effect on sleeping?

2. (Ejercicio 7.3, Wooldridge (2003)). Using the data in GPA2.RAW, the following equation was estimated:

$$\begin{aligned} \hat{sat} &= 1028{,}10 + 19{,}30hsize - 2{,}19hsize^2 - 45{,}09female \\ &\quad (6{,}29) \qquad (3{,}83) \qquad (0{,}53) \qquad (4{,}29) \\ &\quad -169{,}81black + 62{,}31female \cdot black \\ &\quad (12{,}71) \qquad (18{,}15) \\ &\quad n = 4137, \quad R^2 = 0{,}0858 \end{aligned}$$

The variable *sat* is the combined SAT score, *hsize* is size of the student's high school graduating class, in hundreds, *female* is a gender dummy variable, and *black* is a race dummy variable equal to one for blacks, and zero otherwise.

(i) Is there strong evidence that $hsize^2$ should be included in the model? From this equation, what is the optimal high school size?

(ii) Holding *hsize* fixed, what is the estimated difference in SAT score between nonblack females and nonblack males? How statistically significant is this estimated difference?

(iii) What is the estimated difference in SAT score between nonblack males and black males? Test the null hypothesis that there is no difference between their scores, against the alternative that there is a difference.

(iv) What is the estimated difference in SAT score between black females and nonblack females? What would you need to do to test whether the difference is statistically significant?