

ECO 307: Econometrics

Instructor: James Murray

Homework Assignment: Introductory Statistics

Due Wednesday, November 18, 2015 to the appropriate D2L drobox folder

Fall 2015

The dataset posted on the class website, `smoke.RData`, includes a binary variable on whether people smoke (`smokes`), and the following possible explanatory variables:

- Cigarette price (in cents/pack): (`cigpric`)
- Annual income: `income`
- Education: `educ`
- Age: `age`
- Binary variable for whether the state has a restaurant smoking restriction: (`restaurn`)
- Binary variable for race equal to 1 when a person is white: (`white`)

Estimate a regression predicting the probability that a person smokes depending on the above explanatory variables. Use the natural log of income rather than income among your explanatory variables, and the natural log of cigarette price rather than the cigarette price.

1. What impact does an increase in the cost of cigarettes by 1% have on the probability that someone smokes? Construct a 95% confidence interval.
2. Does imposing a ban on smoking in restaurants cause smoking prevalence to decrease?
 - (a) Test the appropriate hypothesis.
 - (b) Construct a 95% confidence interval for the impact the smoking ban has on smoking prevalence.
3. Suppose someone has an income equal to \$6,500, has 16 years of education, is 45 years old, is white, and does not have a smoking ban in his state. What does the regression predict is the probability that the person smokes?
4. Accounting for the other variables in the model, does race affect whether or not a person smokes?
 - (a) Test the appropriate hypothesis.
 - (b) Construct a 95% confidence interval for the impact race has on smoking prevalence.
5. Re-estimate the regression model with the following interaction terms:
 - `restaurn` by (log) `income`
 - `restaurn` by `age`
 - (a) Does the restaurant ban have differential effects depending on people's income? Test the appropriate hypothesis. If so, describe the relationship.
 - (b) Does the restaurant ban have differential effects depending on people's age? Test the appropriate hypothesis. If so, describe the relationship.
 - (c) With this model that includes interaction effects, test the hypothesis that the smoking ban influences the probability that a person smokes.