ECO 307: Introductory Econometrics **Your Name:** _____
Instructor: Dr. James Murray
In-class Exercise: Panel Regression Analysis
Fall 2015

Learning Objective: (LO 2) Construct, estimate, and interpret regression models to identify relationships between explanatory and outcome variables.

Group Work Terms and Conditions: Work in groups of up to four people and answer the following questions. All papers will be collected, but only one member's paper will be randomly selected and graded and all members of the group will receive the same grade.

By signing below, you agree that the following work represents the efforts of everyone in the group, and you are willing to accept as your own grade for the group project the grade earned from this representation of your group's work. Every member must agree to these terms to earn a non-zero grade for this assignment.

Signature Group Member 1	Print Name	Date
Signature Group Member 2	Print Name	Date
Signature Group Member 3	Print Name	Date
Signature Group Member 4	Print Name	Date

Please write your work on separate sheets of paper and stable this sheet to the front.

Data Description: The variables below on smoking behavior and possible explanatory variables were collected from the Current Population Survey from more than 200,000 individual individuals in 2007 and 2010. Between 2007 and 2010, 15 U.S. states passed laws completely banning smoking from all indoor places of employment, restaurants, and bars. Health economics researchers are interested in whether statewide smoking bans *lead* to lower incidence of smoking. The data below includes only the 39 states where there was no state-wide smoking ban in 2007.

Variable Name	Description
`YEAR`	Year observation was collected, equal to 2007 or 2010
`STATEFIP`	State FIPS code, a numerical code unique for each U.S. state
`AGE`	Age of person
`RaceWhite`	Binary variable for whether (=1) or not (=0) the person is White
`HSgrad`	Binary variable for whether (=1) or not (=0) person is a high school graduate
`TwoYrGrad`	Binary variable for whether (=1) or not (=0) person has *at least* a two year college degree
`FourYrGrad`	Binary variable for whether (=1) or not (=0) person has *at least* a two year college degree
`smokes`	Binary variable for whether (=1) or not (=0) a person smokes.
`ban2010`	Binary variable for whether (=1) or not (=0) the state of the person's residence passed a smoking ban between 2007 and 2010.
`year2010`	Binary variable for whether (=1) or not (=0) the observation was collected in 2010.

1. Conduct an independent samples t-test compute the percentage of people who smoked in 2007 and 2010 and determine if there statistical evidence that the incidence of smoking changed. Did smoking incidence rise, fall, or stay the same?

2. Describe some problems using this independent samples t-test to make conclusions on the impact that state smoking bans have on smoking incidence.

3. Taking into account the effect age, age-squared, education, and race have on whether or not a person smokes, is there evidence that the smoking ban reduced the incidence of smoking?

   - Construct a regression model appropriate for answering this question.
   - Explain how your hypothesis test addresses the question.
   - Conduct the hypothesis test.
   - Construct a 95% confidence interval for the impact that a statewide smoking ban has on smoking incidence.

4. Use your regression model above and determine whether education has an effect on whether or not a person smokes. Conduct the appropriate hypothesis test.

5. Both `AGE` and $\texttt{AGE}^2$ are highly statistically significant. Describe the behavior of smoking incidence with age. Is there a estimated age at which the behavior changes?