

**ECO 307: Introductory Econometrics**  
**Constructing Your Model**  
**Instructor: James Murray**

**Purpose:** The purpose of these writing assignments is for you to organize your own thoughts, develop a plan for your project, and help you apply the class content in each step of the empirical research process.

**No audience:** This is informal writing. There is no “audience” for your work. While your instructor will assign a pass/fail grade based on your effort for each of these assignments, the instructor is not your audience. The purpose of these writing assignments is not to communicate anything to anyone. The purpose is writing to learn. You write these assignments for your own benefit only. Working through these writing assignments provides a structured approach to help you grow in your understanding of how to apply econometric techniques to an empirical project.

**Share your work:** You will complete these assignments in a public Google Drive folder shared with all other students in the class. All the students in the class can see your work, learn from it, and even use it to help them complete their own work. You can also read other students’ submissions to help you think about how you want to think through your work.

1. Define concisely what *causal relationship* you will examine.
2. Define the *causal variable* and the *outcome variable*. Discuss the content and the precise measurement.
3. Write down a simple regression equation (one  $x$  and one  $y$ ) that corresponds to your responses above.
4. Discuss possible sources of omitted variable bias in the simple linear regression equation above. In this description, describe a potential omitted variable, what impact it has on the causal and explanatory variable, and what the implications are in terms of bias in your regression.
5. Discuss other variables that you can include in your regression model to address potential omitted variable bias. What potential for bias may still remain?
6. Write down a multiple regression equation (one  $y$  and many  $x$ 's') that corresponds to your responses above.
7. Do you think the effect of the causal variable could be different for different subgroups of your population? For example, could the causal variable have a different effect for male versus female? Could the causal variable have different effects for old people versus young? Augment your model with interaction variables to account for this possibility.
8. Based upon your answers above, write down your regression model again.

**Upload your submission to both the appropriate Canvas assignment and the Google Drive folder by Monday, April 8, at 5:30 PM.**