**Practice Questions for Exam**

* In addition to any question from previous practice questions[[1]](#footnote-1) (included the ones asked in midterms and problem sets) make sure you are comfortable answering any of the following questions regarding the last third of the material.
* Reading comprehension questions for Instrumental Variables Chapter. For any given study that uses IV (practice with: KIPP, Arrests/Coddling, twins & same gender, Queens, City shape) answer the following questions (a subset of these questions will be ask, with minor modifications, in the final):

1. What is the treatment and outcome?
2. What is the instrument?
3. List each IV assumption and discuss if the instrument meets the assumption or not. For the last two, suggest stories where these assumptions might not hold:
   1. Relevancy
   2. Independence
   3. Exclusion restriction
4. Describe who are compilers, always-takers, never-takers and defiers in the specific case of the study.
5. Describe how to use subpopulations with few compliers to indirectly test for the exclusion restriction.
6. Write down the first stage equation, interpret phi.
7. Write down the reduced form equation, interpret rho.
8. Write down the LATE estimate as a ratio, for the case with one instrument.
9. Write down the two equations that correspond to 2SLS.
10. Write down an OLS regression that does not use IV, interpret beta (parameter on treatment).
11. Describe the population for which the LATE applies.
12. Look at the table of results from any IV study and interpret the coefficients and SEs that correspond to First Stage, Reduce Form, 2SLS, and OLS (without IV).

* Reading comprehension questions for Regression Discontinuity Design Chapter. For any given study that uses RDD (practice with: MLDA, Peers, Older siblings and college, and others) answer the following questions (a subset of these questions will be ask, with minor modifications, in the final):

1. Describe outcome and treatment
2. Describe the selection or OVB problem
3. Define if its and Fuzzy or Sharp RDD
4. Describe the running variable
5. Explain what the RDD assumptions mean in this particular study
   1. Assumption of well modeled non-linearities
   2. (bonus) Assumption of non-manipulation of the score around the cut-off
6. Interpret the results
7. Describe in simple terms what a non-parametric approach would do in this case?
8. If fuzzy describe the connection between it and IV
   1. What is the outcome?
   2. What is the treatment?
   3. What is the instrument?
   4. How should we interpret the 3 IV assumptions in this case?
   5. What is the first stage?
   6. What is the reduce form?
   7. What are the 2SLS equations?
   8. Interpret the results

* Reading comprehension questions for the Difference in Difference Chapter. For any given study that uses DD (practice with: Monetary policy, MLDA, Minimum Wage, Mariel Boatlift, Education and Salaries) answer the following questions (a subset of these questions will be ask, with minor modifications, in the final):

1. Describe outcome and treatment
2. Describe how you would address this problem using regression.
3. Describe the selection or OVB problem
4. Describe the problem of including bad controls (this material will be covered during Monday’s Class).
5. Show how the DD estimator is the same as the coefficient delta in the following regression
6. Draw a plot with two lines. One for treatment one for controls with only two periods each pre-treatment and post treatment. Indicate where in the plot is the treatment effect.
7. For a toy data set with 8 observations: construct the TREAT variable, the POST variable, and the interaction between the two of them.
8. Describe the main DD assumption in this case.
9. Construct the two-way fixed effect regression
10. Assume that you have more data on the plot for (4), with more periods before the intervention. What would the plot look like if the main assumption doesn't hold?
11. How would you modify your DD estimation to address the problem described in (7)? What do you need to be able to properly identify this effect? Write down the new fixed effect equations.
12. Interpret the results of a table with DD output.
13. Discuss the role of serial correlation in observations and its effect in the standard errors.

1. As suggested in class: if you are struggling in the course, one suggested strategy for the exam is to focus on understanding the last four chapters (ch3-ch6) of the book and answering the new questions added here to test reading comprehension. As you go over the new material in each chapter you will find some gaps in your knowledge regarding previous concepts (regression, OVB, RCTs, potential outcomes, etc), tackle those gaps once you run into them (as oppose to starting from the begging in of the class and trying to build a solid foundation from beginning to end) [↑](#footnote-ref-1)