

Methodology Minor Field Exam

Spring 2018

For the minor field exam, you must answer two questions, one in the morning session and one in the afternoon session. In the afternoon session, you may use the software of your choice. You are free to use whatever word processing or typesetting software you like to write your answers. The questions must be answered in the allotted time.

For the morning session, internet usage is prohibited. For the afternoon session, you may use the internet to download software packages or look up reference information as you complete the data analysis. Your work must be fully your own. Enjoy this opportunity to showcase your skills.

Morning Session: Statistical Theory and Modeling Decisions

Answer one of the following two questions:

1. *Causal Inference:* The tools of causal inference are often used to determine how effective a certain policy is. For example, a causal study might evaluate how a universal health insurance program in Mexico affected citizens' reporting access to a primary care doctor. Presumably, for the policy to be deemed a success, the policy would have to increase the number of citizens reporting access to a primary care doctor.

Why, theoretically, is it difficult to determine how effective a policy is in shaping a public outcome of interest?

Name three methods that are used for causal inference. Describe how each method is applied in practice and why it theoretically helps us isolate a treatment effect. For each method give an example of a hypothetical policy, a hypothetical outcome of interest, and how you could use that method to estimate the effect that the policy had on the outcome of interest. (If it is easier to use real policies and outcomes in your examples, feel free.) For the sake of each example, you may dictate how the policy is rolled-out, whether there were temporal observations before and after the policy roll-out, whether there is geographic variation, and whether there is individual-level variation. Possible examples might be policies regarding employment, election administration, policing, auditing, trade practices, or anything else that may come to your mind.

2. *Qualitative Analysis*: Consider the following puzzle: In some countries, state-owned media operations have been able to maintain journalistic integrity and independence from political leaders (such as PBS in the United States and the BBC in the United Kingdom). However, in many cases state-run media become a tool of political leaders, and journalists do not operate independently (as in the case of North Korea, for instance). Suppose you wanted to answer the following research question: Why do some state-owned media outlets enjoy more journalistic independence than others? One hypothesis might be that countries which had an existing respect for civil liberties at the time of the media outlet's founding are more likely to respect independence than those that did not have a commitment to civil liberties in place beforehand.

How would you construct a qualitative research design to test this hypothesis? Be sure to explicitly address how you would select the cases that you would study. What kinds of information would you need to gather for each case? Would you examine the historical record? Conduct interviews with officials, business elites, or ordinary citizens? Would you examine records of laws and agreements? Whatever type of information you would gather, explain what specifically you would need to study (e.g., what kinds of historical details you would need, or whom you would need to interview). Explain how it would help you test this hypothesis.

Based on your proposed research design, in what circumstance would you conclude that the hypothesis is correct? That is, what evidence would convince you that a preexisting respect for civil liberties does lead to more journalistic independence in state-owned news outlets? In what circumstance would you conclude that the hypothesis is wrong and there is no evidence that respect for civil liberties affects independence in state-owned outlets? Why does each set of circumstances lead to the respective conclusion?

Afternoon Session: Analyzing Data

Answer one of the following two questions:

3. *Linear Regression:* Please analyze the data set *govduration* using a linear regression model. The data set contains information on the duration of parliamentary governments for 22 nations in the post-World War II era. The data can be found here: http://spia.uga.edu/faculty_pages/mlynch/teaching/govduration.dta.

The variables are as follows (you must use them all):

govdur Average duration of parliamentary governments per country
(**dependent variable**).

NP Number of parties is average number of parties in the governing coalition of parliamentary governments (ranges from 1 to 4.3).

PS Parliamentary support is a measure of the percentage of the lower house of parliament controlled by the party or parties in government (ranges from 41.1 to 80.4).

PD Party discipline is a dichotomous measure of party discipline in each country's parliament (0 = low discipline, 1 = high discipline).

Present the results of this model in a table including the coefficients, the standard errors, the R^2 , and any additional information you would like. What can you conclude from the t -ratios associated with each coefficient? What can you conclude from the model fit?

Next, please test the conditional hypothesis that the number of parties in government influences government duration, but this effect is conditioned by the level of parliamentary support enjoyed by the governing party or parties. Estimate a new model to test this hypothesis and discuss the results. Illustrate the nature of this conditioned relationship by graphing predicted values and confidence intervals. Provide a detailed interpretation of the conditional relationship and whether or not you think it matters.

Then compare the fit of the two models and discuss the implications of including the conditional relationship described above relative to not including this. Which model do you feel is a better fit to the data and why?

Finally, discuss whether or not you think OLS is the appropriate estimator for these data. If so, justify your response. If not, what model do you think would be a better estimator and why?

4. *Count Model*: Please analyze the data set *harr* using a count model. These data were gathered by the International Policy Institute for Counter-Terrorism in Herzlia, Israel. You are studying Mark Harrison's subset of 103 suicide attacks from November 6, 2000 to November 3, 2003. The data are posted in Stata format at http://spia.uga.edu/faculty_pages/monogan/teaching/extra/harr4.dta. The outcome of interest is the number killed in each attack (**NumberKilled**), and the input variables are as follows:

Date When the attack occurred, measured in days since November 5, 2000.

AttackerisChallenged Indicator variable equal to 1 if the attacker met resistance, 0 otherwise.

FirstAttackerisFemale Indicator variable equal to 1 if the first attacker is female, 0 otherwise.

TargetisMilitary Indicator variable equal to 1 if the military was the intended target, 0 otherwise.

ResponsibleHamis Indicator variable equal to 1 if Hamas claimed responsibility for the attack, 0 otherwise.

Would a Poisson model be appropriate in this case, given that this distribution assumes the variance is the same as the mean? How do you know this? Would a zero-inflated model be more appropriate than a negative binomial or Poisson model that does not consider zero inflation? How do you know this? Use your answers to these questions to determine the most appropriate model, and then present the results of this model in a table including the coefficients, the standard errors, at least one fit statistic, and any additional information you would like. What can you conclude from the z -ratios associated with each coefficient? Please assess the effect of each input variable using partial changes in the conditional mean, factor change in the conditional mean, discrete change in the conditional mean, or predicted probabilities of counts.