

## Political Methods Field Exam – Spring 2021

Field Committee: Dr. Daniel Morey, Dr. Stephen Voss, Dr. Justin Wedeking

Instructions. This field exam has three sections, and you are to answer one question from each section (*three* questions in total). Identify each answer by the section title and question number when you begin writing. A full reference page is not required, but you should identify authors (and years) associated with arguments or themes to strengthen your answers.

### Statistics and Probability Theory

1. Consider the following statements. For each statement, indicate whether ignoring it and running a classic linear regression model of  $Y$  on  $X$  will generally lead to (1) biased coefficients (2) biased estimates of standard errors (3) both or (4) neither. If (1) – (3), list an alternate model you would estimate to address this problem.
  - a.  $\text{Var}(u_i|X_i) = \sigma^2 [\exp(X_i)]$
  - b. We omit a relevant independent variable from the regression model.
  - c. Our dependent variable is bilateral trade between countries and a lot of countries do not trade with each other.
  - d. We believe our errors follow an AR(1) process.
  - e. We include an endogenous regressor as an independent variable.
2. Answer the following questions regarding interactions.
  - a. What is an "interaction term" in linear regression?
  - b. How is it constructed mathematically, and how is it interpreted?
  - c. The logistic regression model is often described as automatically interactive. In what sense is logit "interactive"?
  - d. Would one ever use an interaction term, of the sort you've described for linear regression, in the logit if that model is already interactive?
  - e. How would your interpretation of an interaction have to change if such a term were included into an already interactive model?

## Application

1. You've been approached by a group of election reformers who want to change how New York state draws legislative districts. (Their bill would take authority from the state assembly and give it to a nonpartisan commission.) They know from their experience trying to get the bill passed previously that they will be pummelled during legislative hearings with research evidence indicating that redistricting is not actually responsible for the problems they wish to address, including a high-profile *Journal of Politics* article authored by Abramowitz, Alexander, and Gunning. They are hoping to hire you as a consultant and expert witness to design an improved study to address shortcomings in the Abramowitz, Alexander, and Gunning article and allow them to make the case for their legislation. First, identify the major shortcomings in the Abramowitz, Alexander, and Gunning article. Then offer specific improvements for each of these shortcomings, be specific regarding why you feel your proposal will address the issue(s) you identify. The goal is a realistic research design that you could implement.
2. You are asked to analyze preferences for government spending. Conceptually, your theory predicts that distrust of government will lead to a desire for less spending. Problem is, you have no exact measure of distrust in government. Instead, you have a handful of ordinal variables, some from questions allowing three responses and some allowing four, all of which partly capture distrust in government but all of which contain other sources of variation as well (not necessarily just stochastic noise). You also have one open-ended question on the issue of distrust in government. What are your options as an analyst, in terms of using these data to consider distrust as an independent variable? What are the virtues and what are the dangers of each alternative? Which option would you recommend as the best approach after weighing all of the strengths and weaknesses?

## Assessment

1. You were assigned "Barriers to Trade: How Border Walls Affect Trade Relations" by Carter and Poast to read prior to this exam. Provide a detailed critique of the research design and methods used in the article. Be sure to explain how inference could be threatened from the decisions in the research design. Give two specific improvements for the research design in this article, focus on what inferential problem you are trying to resolve and how your suggested improvement would potentially solve the problem.
2. You were assigned "Authoritarianism and American Political Behavior from 1952 to 2008" by Cizmar, Layman, McTague, Pearson-Merkowitz, and Spivey to read prior to this exam. Provide a detailed critique of the research design and methods used in the article. Be sure to explain how inference could be threatened from the decisions in the research design. Give two specific improvements for the research design in this article, focus on what inferential problem you are trying to resolve and how your suggested improvement would potentially solve the problem.