Political Methodology Comprehensive Examination

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May 2009

Instructions: You have five hours to complete the exam

Part I

1. One case that was discussed with respect to the Alito nomination to the Supreme Court is the case of *Riley v. Taylor*. Here is one account of the case: "The plaintiff Riley, convicted at trial of first-degree murder, was African-American; at the trial, the prosecution used its peremptory challenges to eliminate all three of the African-Americans on the jury panel. In the same county that year, there were three other first-degree murder trials, and in every one of those cases all of the African-American jurors were struck. Riley appealed his conviction. A majority of the judges on the appeals court thought that there was evidence that jurors were struck for racial reasons. According to them, a simple calculation indicates that there should have been five African-American jurors amongst the forty-eight that were empanelled in the four cases. However, there were none. To these judges, this was clear evidence of racial motivation in the striking of such jurors. Judge Alito dissented." Adding some information to this description, 31 potential jurors were not seated, and 8 of them were African-American.

(a)   Using an alpha level of .01, test whether the race of the potential jurors and whether potential jurors were seated are statistically dependent.

(b)   If you rejected the null hypothesis in (a), what might you argue to question the result in (a)? If you did not reject the null hypothesis in (a), what might you argue to question the result in (a)?

2. You are pre-testing a political psychology experiment, exposing one group to a treatment, with another group as a control. Each group has 5 members, with the treatment group having scores of [3, 4, 2, 1, 6] and the control group having scores of [7, 9, 5, 6, 7]. Construct the appropriate 95% confidence interval for the difference in the means of the two groups and describe precisely what the 95% confidence interval means.

3. Describe what is meant by probability theory. In what sense is probability theory a theory?

4. Say you estimated a linear regression model and obtained the following results:

$$\hat{y} = 10 + 6 \cdot \text{income} + 3 \cdot \text{male} - 2 \cdot \text{north} + 2 \cdot \text{male} \cdot \text{north},$$

where income is a continuous variable, male is a dummy variable equaling 1 for males, 0 otherwise, north is a dummy variable that is 1 for people in the north, 0 otherwise, and

male · north is an interaction of the two dummy variables. What parameter estimates for β_0, β_1, δ_1, δ_2, and δ_3 would you obtain if estimated the following equation instead?

$$y = \beta_0 + \beta_1 \cdot income + \delta_1 \cdot NM + \delta_2 \cdot NF + \delta_3 \cdot SF + u,$$

where NM, NF, and SF are dummies for northern males, northern females, and non-northern females, respectively?

5. The output for question 5 shows the univariate distribution of a regime type variable as well as a cross-tab between regime type and state failure (defined in the usual way as the existence of coups, civil wars, etc.). The unit of analysis is at the country level. Failure is coded as {failure = 1, no failure=0}. Say you created dummy variables for whether a country was a democracy and for whether a country was an autocracy and then estimated the following equation with a probit model:

$$failure_i = \beta_0 + \beta_1 \cdot Democracy_i + \beta_2 \cdot Autocracy_i + u_i$$

What would the estimates of β_0, β_1, and β_2 be?

Do not conduct a test, but if you had to guess, do you think you could reject the null of parameter equality $\beta_1 = \beta_2$? Why or why not?

4. What does it mean for an estimator to be unbiased and efficient? In general, how can one establish the efficiency of an estimator?

5. What does it mean for an estimator to be consistent? How does one determine whether an estimator is consistent?

6. Suppose you are interested in examining the factors that explain the adoption or rejection of laws prohibiting straight-ticket voting in each of the 50 states. Since states adopt or change their policies at different points in time, and because some states change their laws over time, you collect data for each state over a 25 year period of time. You also collect data on exogenous variables that will help you explain whether or not a given state has straight-ticket voting in a given year. What estimation problems are you likely to encounter with these data, and how would you deal with them?

7. Suppose you are trying to explain and to predict the vote percentage of the incumbent party for president (V_t), and as explanatory variables you have data on the unemployment rate (E_t) and presidential approval (A_t), both measured six months prior to the election. You have data on 12 elections, t=1,...,12. Historically, you know that approval ratings are low when unemployment is high, and so you specify the following structural equations:

(1) $A_t = \alpha_1 + \beta_1 E_t + \varepsilon_{1t}$

(2) $V_t = \alpha_2 + \beta_2 E_t + \beta_3 A_t + \varepsilon_{2t}$

Under what conditions, if any, will OLS be appropriate for estimating the parameters in equations (1) and (2)? If conditions appropriate for OLS exist, are they reasonable in this case? What alternative estimation techniques might be used, and under what conditions will they be appropriate (i.e., produce parameter estimates with desirable properties)?

Part II

Either submit an empirical research paper along with the exam or schedule an oral exam after the written exam.

Good luck!

Output for Question 5

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. tab type

                          type |      Freq.      Percent         Cum.
---------------------------------+---------------------------------------------
                     Democracy |         58        31.18        31.18
Newly transitioning democracy |         55        29.57        60.75
                     Autocracy |         73        39.25       100.00
---------------------------------+---------------------------------------------
                         Total |        186       100.00


            |                 type
    failure | Democracy  Newly tra  Autocracy |     Total
------------+---------------------------------+----------
    failure |        18         28         26 |        72
            |     31.03      50.91      35.62 |     38.71
------------+---------------------------------+----------
 no failure |        40         27         47 |       114
            |     68.97      49.09      64.38 |     61.29
------------+---------------------------------+----------
      Total |        58         55         73 |       186
            |    100.00     100.00     100.00 |    100.00
```