PLSC 502: "Statistical Methods for Political Research"

Exercise Nine
December 2, 2024

Introduction

This homework is an opportunity to demonstrate your mastery of bivariate linear regression. The topic (and source of the data) is the 2024 general election in Pennsylvania. This exercise does *not* have a simulation component.

Exercise

The data for this exercise – which are available in the course Github repository, in the folder labeled "Exercises" – contain information on the 67 counties in Pennsylvania. They include a number of variables, most relevantly:

- Voter registration data: The number and percentage of voters in each county registered as Republicans, Democrats, Libertarians, and "other." These data are from early November 2024, and were extracted from the website of the Pennsylvania Department of State.

- The number and (two-party) percentage of votes for each of the two major-party candidates in the 2024 races for president (Kamala Harris - D and Donald Trump - R) and U.S. Senate (Robert P. Casey Jr. - D and Dave McCormick - R).[1] Those data were pulled from the Department of State's Election Reporting Center.

Your assignment is to use OLS regression to examine the relationship between the percentage of the two-party vote received by <u>one</u> of the major-party candidates for president *or* senator and the percentage of voters registered as <u>one</u> of {Democrats, Republicans, Libertarians, Other} in that county. For the exercise, prepare a short (1000 words or less) report on that relationship, as if you were writing up the results for a paper or journal submission. Accordingly, your report should contain *at least* the following:

1. Very brief summaries of the dependent and dependent variables, including a graphical presentation of the relationship;

2. Nicely-presented results of your OLS estimate(s), including coefficients, standard errors, and other relevant statistics;

3. A discussion, in words, of those results, including matters relating to marginal effects and statistical inference; and

4. A brief discussion of model fit.

This homework should be submitted electronically, in the usual fashion. It is due by 11:59 p.m. ET on **Wednesday, December 11, 2024**, and is worth the usual 50 points.

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[1]The file also contains detailed breakdowns of vote totals by voter mode (in-person, mail-in, provisional); you need not pay these numbers any attention right now.