

Problem Set 4

Your name

This week we will be working with Wooldridge's dataset (`VOTE1.dta`).

Quadratic regression (4 points)

1. Imagine that you are a campaign adviser to an incumbent candidate. In the course of your work, you come across a theory that there are diminishing marginal returns to campaign expenditures for incumbents. Using only two variables *VoteA* and *expendA*, test this theory in a regression. (.5 point)
2. Interpret the regression results. (.5 point)
3. Draw a scatter plot and fitted curve, which depict the relationship expressed in question 1. (1 point)
4. If diminishing marginal returns exist, at what point do we begin to see a negative relationship between spending and the incumbent's vote share? (1 point)
5. What is the marginal effect of expenditures on A's share of the vote at \$300,000? What is the marginal effect of expenditures on A's share of the vote at \$600,000? (1 point)

Calculate standard errors + Level-log regression (3 points)

6. Regress *voteA* on *lexpendA* and interpret the regression results. Can we conclude only from these results that higher spending increases chances of victory? (1 point)
7. Following the instruction in lab 4, calculate the standard error of the coefficient on *lexpendA* and the corresponding t-statistic, p-value, and 95-percent confidence interval. Compare these results with the output of the built-in function `lm()`. (2 points)

Heteroskedasticity and Outliers (3 points)

8. Regress *voteA* on *expendA* and interpret the regression results. Using `plot()` to run diagnostics. Explain your findings of each plot. (2points)

Then, answer the following questions: Do you conclude that there is heteroskedasticity in this regression? (1 point)