POLI706: Advanced Methods of Political Analysis

Problem set 6

Load the data, `assignment_data` from Blackboard to your RStudio. Then, answer the following questions using the data. You should assemble and analyze data in accordance with instructions, producing a detailed discussion (including visualizations) of results. All tables and graphs need to be perfectly labeled, and all discussions need to be at journal-quality level. The document must be created in LaTeX, though there are no restrictions on the layout of the document. Screenshots are unacceptable.

Exercise 1

Estimate a model regressing values of the electoral democracy index on logged values of GDP per capita and interpret the results.

Exercise 2

Estimate the same model as in 1 and add EMB autonomy.

a. Interpet the results.

b. Describe what changed between model 1 and model 2.

Exercise 3

Find the partial slope coefficient for EMB autonomy by doing the following:

a. Regress EDI on logged values of GDP.

b. Regress EMB autonomy on logged values of GDP.

c. Regress the residuals from part 3a on the residuals from part 3b.

d. Plot the relationship between residuals from part 3a and part 3b.

e. Describe in simple language what steps a-c are doing.

Exercise 4

Estimate the same model as in 2 and add EMB capacity.

a. Interpet the results.

b. Describe what changed. (Note effect sizes and the R-squared.)

Exercise 5

Using the `vif()` function from the `{car}` package,

a. Check for multicollinearity and report the variance inflation factors (VIFs) for each independent variable.

b. Regress EMB capacity on the other covariates (GDP and EMB autonomy).

c. Use the R-squared from part 5b to manually calculate the VIF for EMB capacity.

d. Regress GDP on the other covariates (EMB autonomy and capacity).

e. Use the R-squared from part 5d to manually calculate the VIF for GDP.

f. Based on 5c and 5e, what explains the difference in VIF scores?

Exercise 6

Estimate the same model as in 1 and add a dummy variable for civil war (`e_civil_war`). Interpret the results.

Exercise 7

Estimate the same model as in 1 and add dummy variables for region (using `factor(e_regionpol_6C)`). Interpret the results.