PLSC 503: "Multivariate Analysis for Political Research"
Exercise Two

February 9, 2022

Introduction

This is an opportunity to fit and discuss multivariate regression model(s). The data are from the Correlates of State Policy database[1] at Michigan State, and comprise data on each of the 50 states plus the District of Columbia ($N = 51$) from the year 2010. The specific variables available to us today are:

- `State`: The two-letter postal code for the state.

- `StateName`: The state's name.

- `FIPS`: the Census FIPS code for the state.

- `Year`: The year (2010).

- `ViolentCrimeRate`: Violent crimes per 100,000 population.

- `MurderRate`: Criminal homocides per 100,000 population.

- `PovertyRate`: Percentage of the population living below the poverty line.

- `Population`: Population (raw numbers).

- `Unemployment`: Percent of the adult population unemployed.

- `Revenue`: Total state revenue (in thousands of dollars).

- `Expenditure`: Total state expenditures (in thousands of dollars).

- `IncomePerCapita`: Per capita personal income, in dollars.

- `Tuition`: Average in-state tuition and fees for a 4-year public institution (in dollars).

- `Gini`: State income inequality (Gini coefficient).

- `EITC`: 1 if the state has an earned income tax credit, 0 otherwise.

- `PctFemaleLegislators`: The percentage of the state legislature (both houses, where applicable) that is female.

---

[1]Grossmann, M., M. P. Jordan, and J. McCrain. 2021. "The Correlates of State Policy and the Structure of State Panel Data." *State Politics & Policy Quarterly* XX:1?21. doi: 10.1017/spq.2021.17

- `VotingPct`: The percentage of the voting-eligible population that voted in the most recent general election.

- `UnionDensity`: The percentage of the non-agricultural workforce that is represented by a union.

- `PolicyMood`: Stimson's policy mood indicator of state ideology (liberalism).

- `HighMinWage`: 1 if the state's minimum wage is higher than the nationally-mandated minimum, 0 otherwise.

- `MedicalMarijuana`: 1 if marijuana is legal for medical use in the state, 0 otherwise.

- `AssaultWeaponBan`: 1 if the state bans assault-style weapons, 0 otherwise.

- `CorruptConvicts`: Number of state convictions for "criminal abuses of public trust by government officials" (2010).

- `CitizenLiberalism`: Berry et al.'s (1998) measure of citizen ideological liberalism.

- `South`: 1 if the state is among the 11 states of the old Confederacy, 0 otherwise.

Exercise

Your assignment is as follows:

1. Choose a response / "dependent" variable from the following list: `MurderRate`, `Tuition`, or `CorruptConvicts`.

2. Choose *three or more* other variables that you believe would be good predictors / explanatory variables for your outcome.

3. Fit, present the results of, and discuss the linear regression of your dependent variable on your independent variables, using the things you've learned in the class to date.

Be sure to include *all* code that you used to complete the various steps above.

This assignment is due no later than Wednesday, February 16, 2022 at 11:59 p.m. EDT. You can submit your homework by emailing copies **both** to Dr. Zorn (`zorn@psu.edu`) <u>and</u> Ms. Onder (`ibo6@psu.edu`). In addition to your responses to the items above, please include all code used to fit models, conduct diagnostics, generate plots, and so forth. This assignment is worth 50 possible points.