Project 3: Classical Non-Linear Models and Police use of Force

Due: Sunday December 8th, 2024, at 22:00

1 Racial Differences in Police Use of Force

Police use of force is a critical and contentious issue in the United States, where incidents involving excessive force have sparked widespread public debate, political and social movements, and calls for reform. Central to this discourse is the question of racial disparities in law enforcement practices, particularly in the use of force. These disparities raise pressing concerns about equity, justice, and systemic bias in policing.

A foundational study by Fryer Jr (2019) explores racial differences in police use of force. It finds that for non-lethal uses of force, Black and Hispanic individuals are significantly more likely to experience some form of force during police interactions. Fryer Jr also notes that while accounting for context and civilian behavior through statistical controls reduces these disparities, it does not eliminate them entirely.

This work received significant media attention, with a summary of its findings becoming one of the most-viewed articles on the New York Times website (Link). However, scholars from diverse fields have since critiqued the study, particularly regarding the limitations of administrative records used in the analysis (see, e.g., Knox, Lowe, and Mummolo 2020). These critiques underscore the need to revisit and critically assess Fryer Jr's conclusions.

2 Data: Police Public Contact Survey

To explore racial differences in police use of force, we will use data from the Police Public Contact Survey (PPCS), which gathers data on police-civilian encounters in the United States. One benefit of this data source is that it gathered from the civilian's perspective, as opposed to that of the police.[1] The dataset `ppcs_cc.csv` contains data on 19 (basic) variables in 3,799 police-civilian encounters.[2] The variable `anyuseofforce_coded` equals one if encounter resulted in any use of force by the police officer(s), and equals zero otherwise. In addition, the dataset includes

- civilian (or *s*ubject) characteristics, including race dummies (these variables typically start with "s", e.g. `sblack`);

[1] Fryer Jr (2019) uses many different data sources. We focus on the PPCS for concreteness.
[2] I give you only part of the original data to avoid introducing additional headaches for you to solve.

- *o*fficer characteristics, including the officer(s) race(s) (these variables typically start with "o", e.g. `omajblack`); and
- other encounter characteristics (e.g., `daytime`).

Appendix A of the supplemental material to Fryer Jr (2019) describes these variables and their types (binary, categorical, continuous, etc.) in detail. Read it carefully.

3 Assignment

Test whether the data is consistent with racial differences in police use of force.

4 Hints

(1) When using an estimation procedure, carefully discuss the assumptions required to derive the estimator and establish properties thereof. Assess whether these assumptions are likely to be satisfied in the current empirical setting. (Don't just copy the math; relate to the current setting.) If not, what are the consequences for the estimator in question (and your results)? Strive to provide a real-world example of behavior that might invalidate a given assumption, carefully linking the behavior or mechanisms to the mathematical symbols in the model.

(2) If you rationalize several model specifications and associated estimates, discuss which one seems the most appropriate and justify your decision (e.g. based on formal testing).

(3) Be precise about the statistical tests you use for testing various hypotheses. Explain which null hypothesis you are testing and the alternative you are testing against, how the test statistic is constructed, the decision rule you employ, and the conclusion you reach. If a variance (matrix) has been estimated, discuss the assumptions invoked for consistency. If several choices are possible, justify your choice.

5 Formal Requirements

- You must hand in a report that presents the econometric model, presents your estimation results and results of formal statistical tests (including interpretation and statements on economic and statistical significance), and discusses the potential weaknesses of the model, data and approach. If you present many estimates of the same parameters (e.g. estimators based on different assumptions, or varying the controls or

sub-sample used), it may be helpful to present the estimates together in one table to facilitate comparison.

- The report must be written in English using an academic language and uploaded to FeedbackFruits via Absalon as a single PDF file.
- The report must be at most five pages of main text (including mathematics) followed by at most two pages of output. Use the following formatting:
  - For the main text (and mathematics), you must use fontsize = 12p, line spacing = 1.5, and page margins = 2.5 cm. Your main text should look like this document. Note that this may differ from your idea of a "normal" page.
  - The ouput can be any (relevant) tables, graphs or images as long as they properly formatted, labelled and readable. Place the output at the end of your report, starting on a new page. Do not worry about this order being inconvenient for the reader.
- Along with your report, you must upload a compressed zip-folder with all the Python code needed to replicate your results. Make sure that your code is transparent and runs with only minor modifications (e.g. changing relevant paths). There is no character limit on the submitted Python code.
- You are allowed (and strongly encouraged) to work in groups of up to three people. List all group members on the front page of your report in alphabetical order of surnames.
- The general assessment criteria are given on the course website in Absalon.

References

Fryer Jr, R. G. (2019): "An empirical analysis of racial differences in police use of force," *Journal of Political Economy*, 127, 1210–1261.

Knox, D., W. Lowe, and J. Mummolo (2020): "Administrative records mask racially biased policing," *American Political Science Review*, 114, 619–637.