Robust inference for geographic regression discontinuity designs: assessing the impact of police precincts

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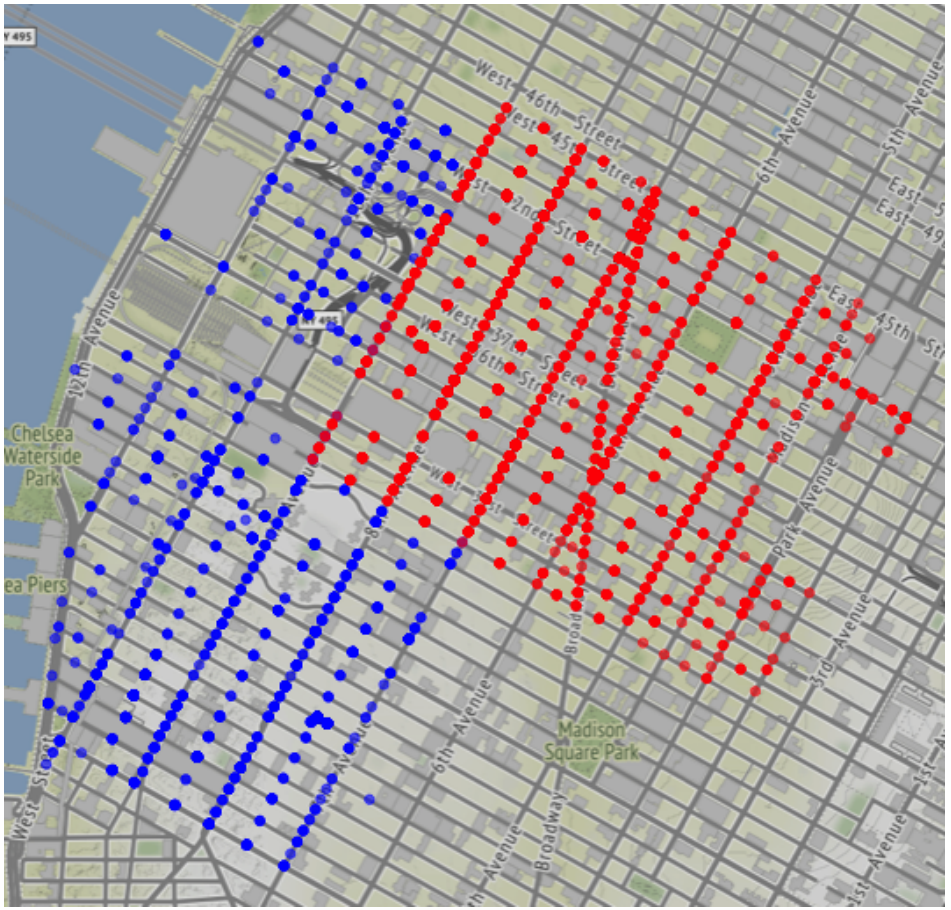
Motivation

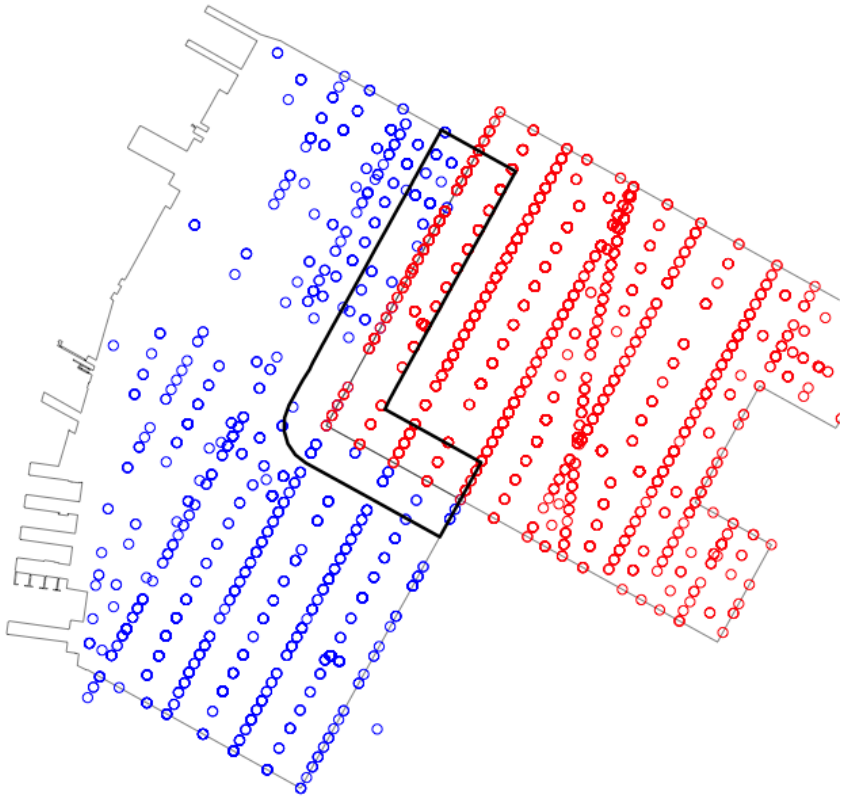
- The New York City police department's (NYPD) Arrest Incident Level Data set.
- **Is there a precinct level effect on arrest rates across New York City?**
- Data is spatio-temporal
- Where do arrests occur? How can we isolate the difference in arrest rates given two precincts?



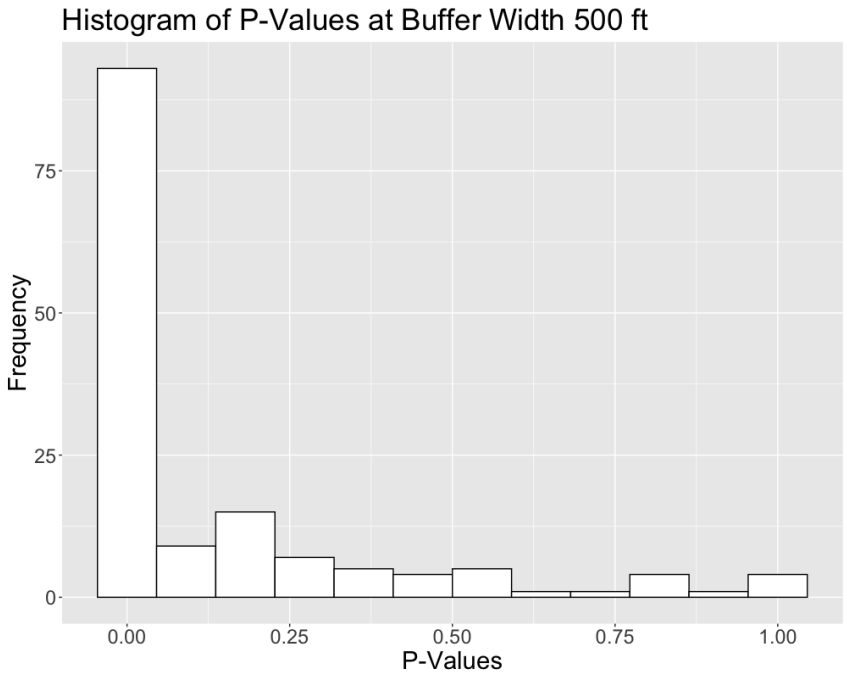
Arrests in precincts 10 (blue) and 14 (red) in 2014.

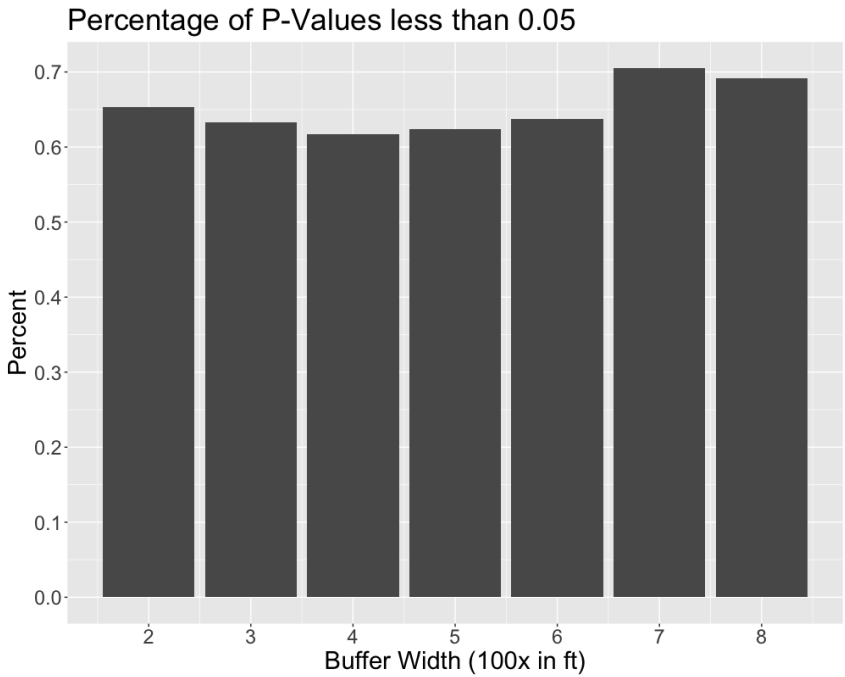
Methodology

- **Geographic Regression Discontinuity Design (GeoRDD)**
- Are the assumptions for GeoRDD met?



Initial Results

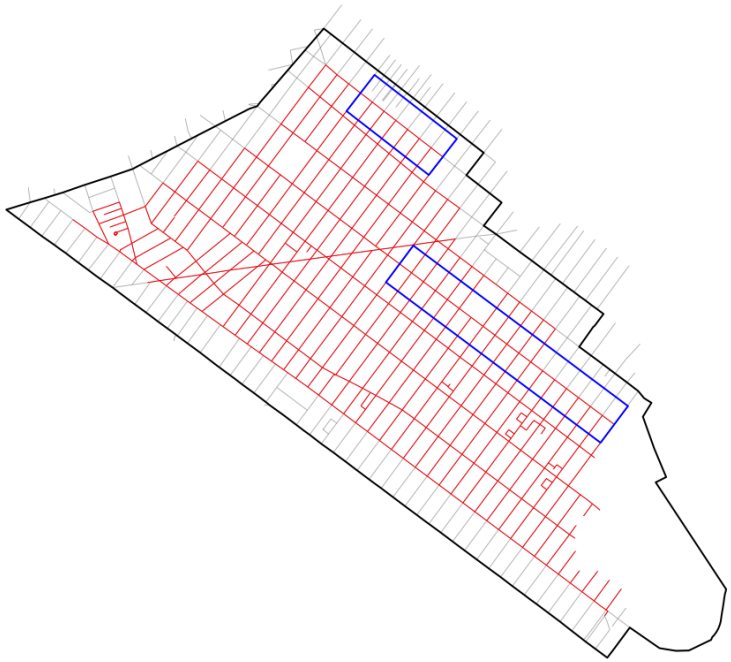




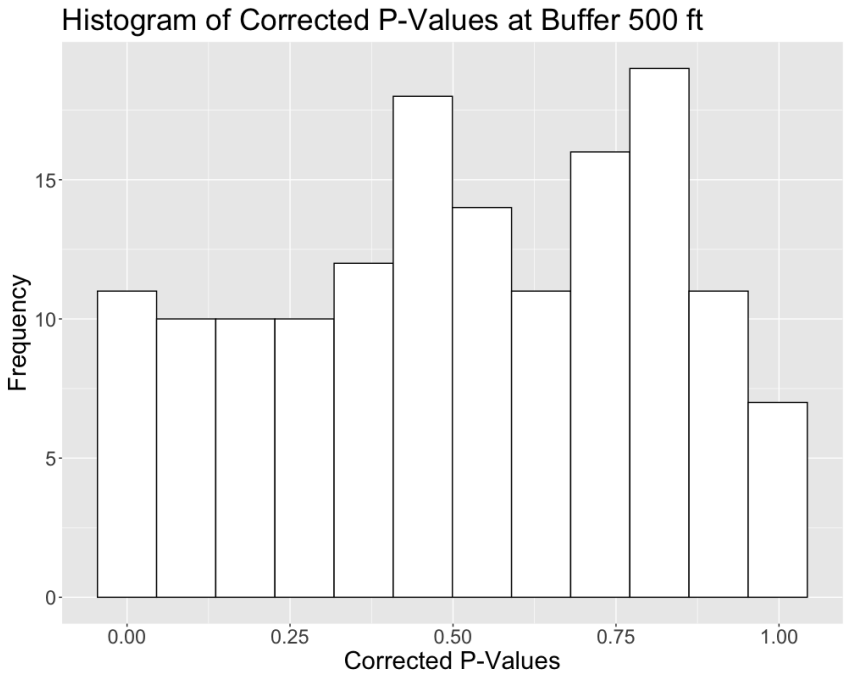
(Left) Distribution of p-values across all 158 borders at buffer of 500 feet. (Right) Percentage of p-values less than 0.05 as a function of window size around the border.

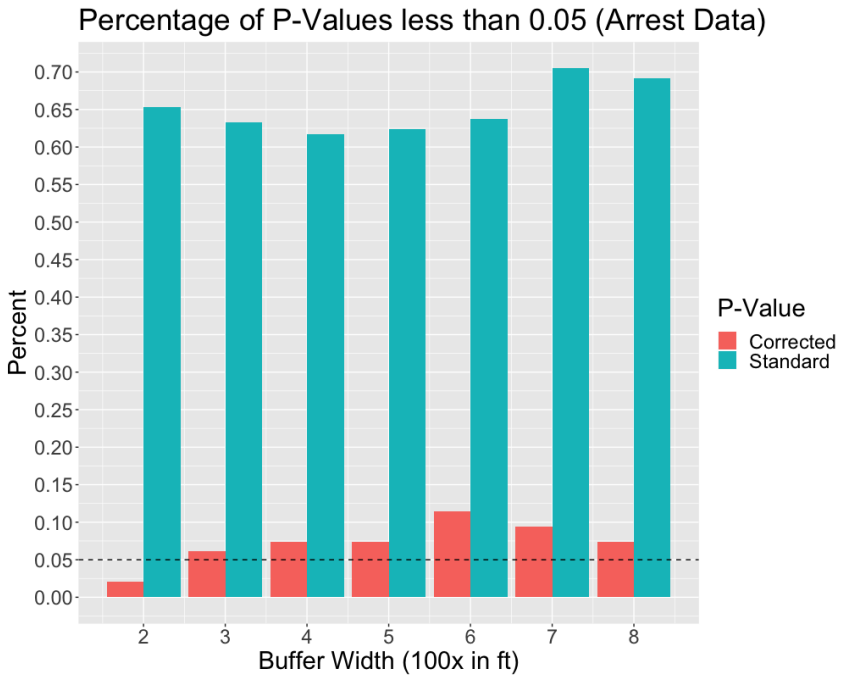
Null Streets

- All arrests occur on streets.
- Find the null distribution of our test statistics in a way that allows for violations of the GeoRDD assumptions.



Corrected P-values





(Left) Histogram of the 158 corrected p-values at a buffer width of 500 feet. (Right) Percentage of p-values that are less than 0.05 before and after the correction as a function of buffer width.

Conclusion

- For more information and results:
  `http://arxiv.org/abs/2106.16124`
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- **Thank you EuroCIM!**