

SEPTEMBER 9 2021

# Predicting Census Tract Eviction Rates

Modeling & Analysis by : Jack Mannix



# GOAL

**To provide the US Department of Housing and Urban Development (HUD) with a predictive tool that can be used to proactively identify Census Tracts with high eviction rates**

# Evictions Impact...

- Physical Health
- Mental Health
- Communities
- Public Health

## Prevention

- 90% of tenants facing eviction go unrepresented in their court cases
- Tenant representation greatly reduces the likelihood of eviction



“

***" Establishing publicly funded legal services for low-income families in housing court could prevent the fallout from eviction, decrease homelessness, and help curb discrimination in the eviction decision "***

~ MATTHEW DESMOND: *Unaffordable America: Poverty, Housing, and Eviction*

”

# Data Acquisition

- Data Sources
  - The Eviction Lab
  - US Census - American Community Survey (ACS)
- 34,594 census tracts
  - 26 States
- 25 features
  - Target = Eviction Rate



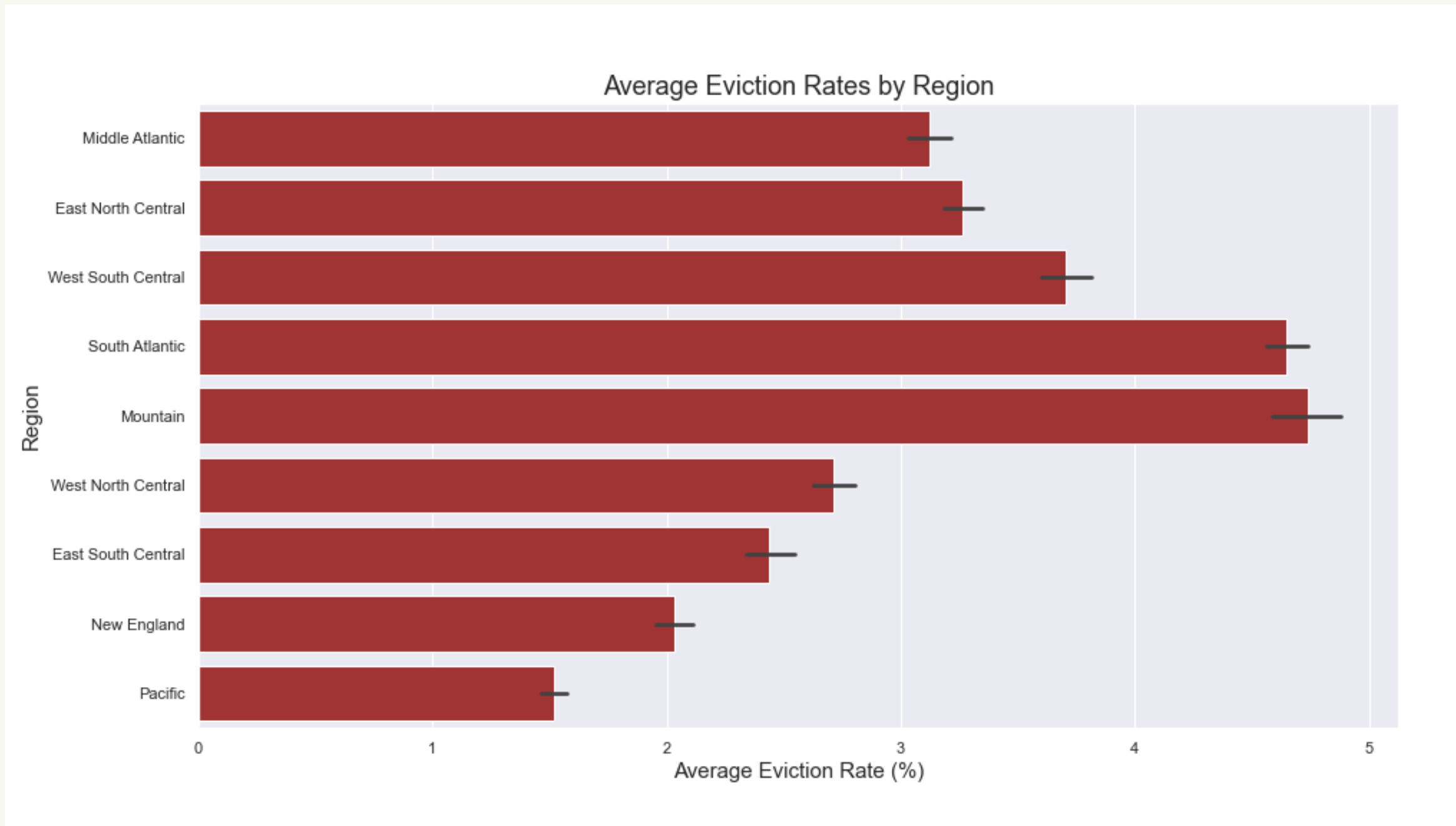
United States  
**Census**

# Methodology

- Every census tract is represented once
  - Feature values are the mean of all available years of a particular census tract
- Removed Data
  - Population = 0
  - Eviction Rate > 90 %
  - Null values for eviction rate after aggregation

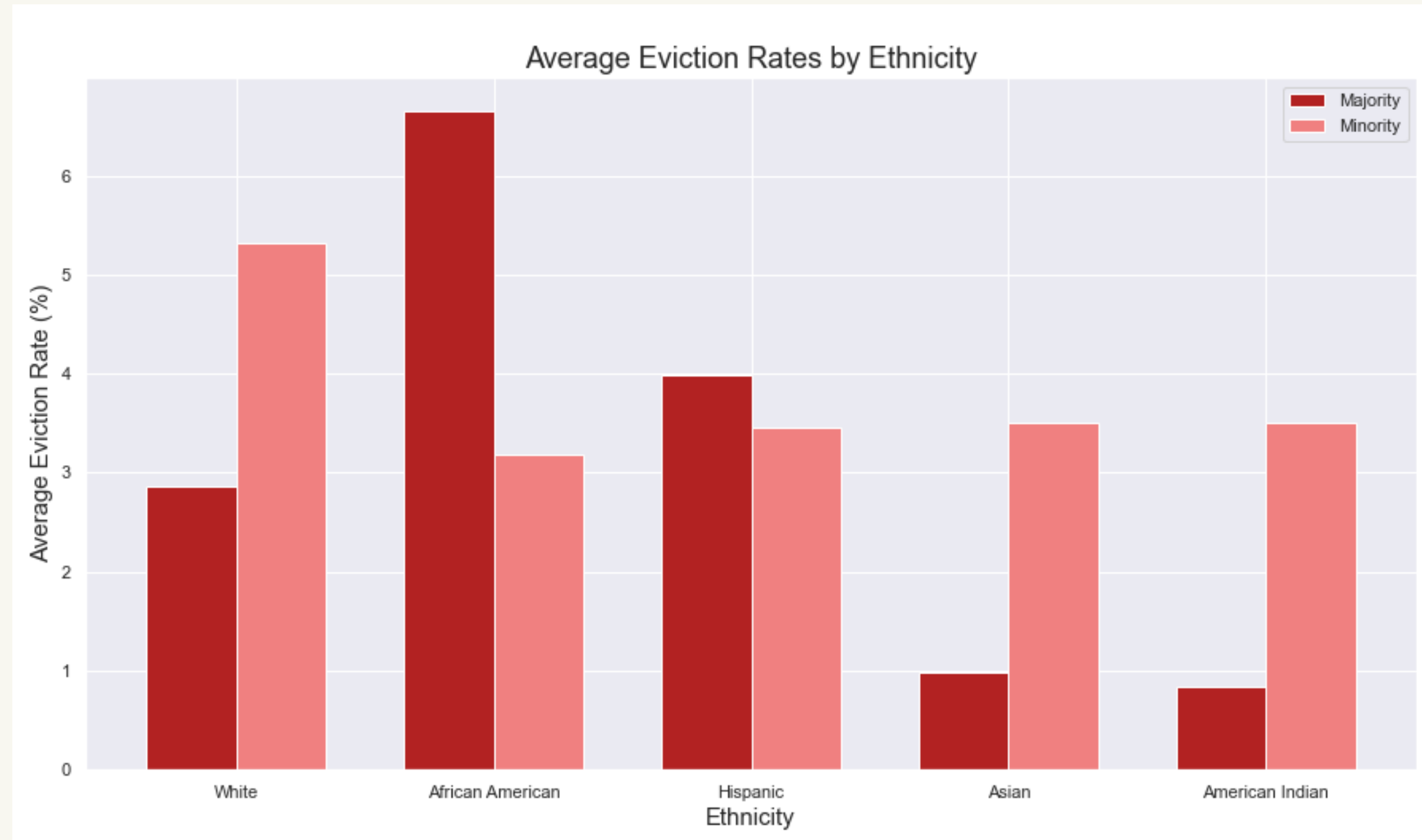
# Data Exploration

- Geographical data represented by census designated regions



# Data Exploration

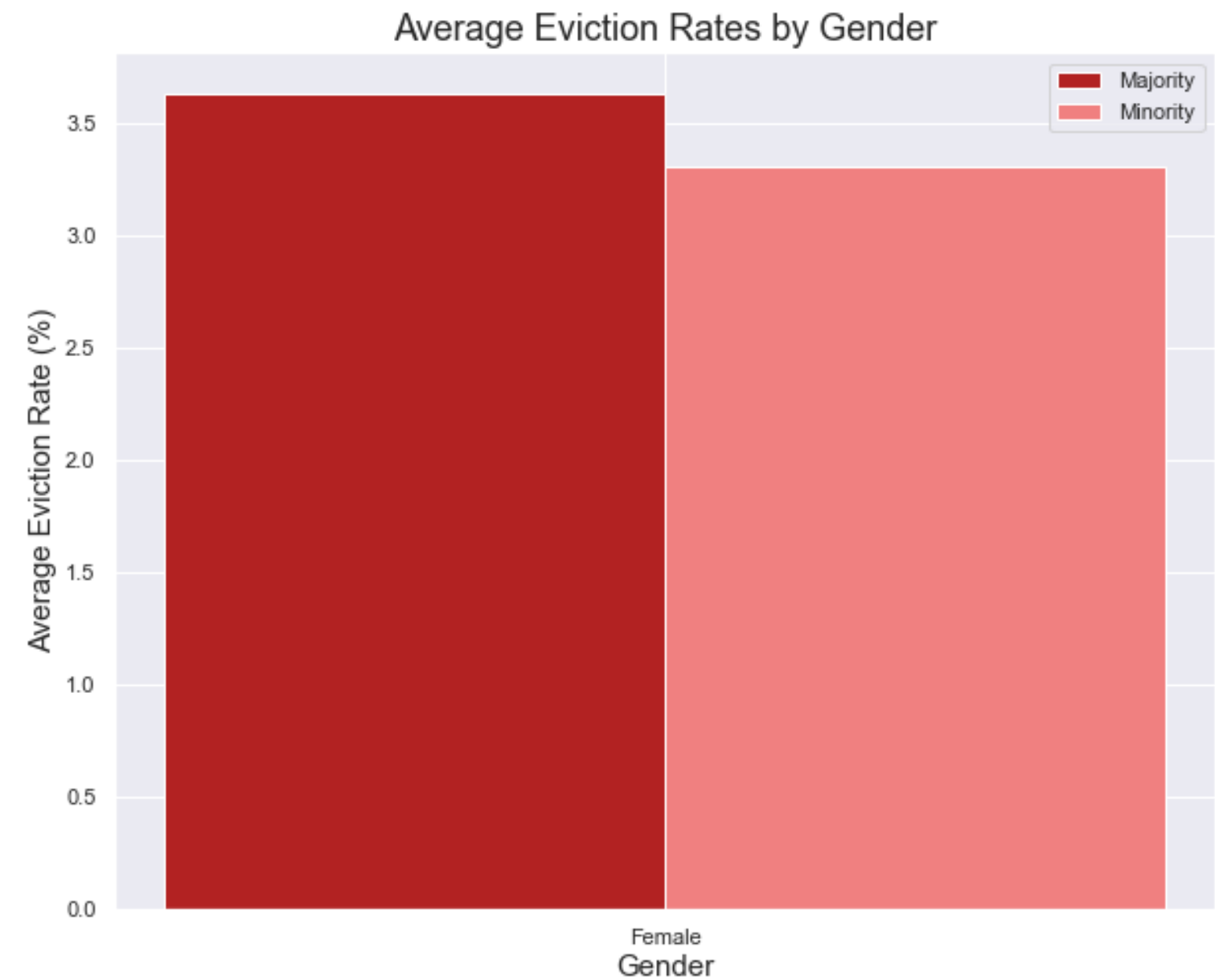
- Majority groups with higher eviction rates
  - African American
  - Hispanic
- Minority groups with higher eviction rates
  - White
  - Asian
  - American Indian





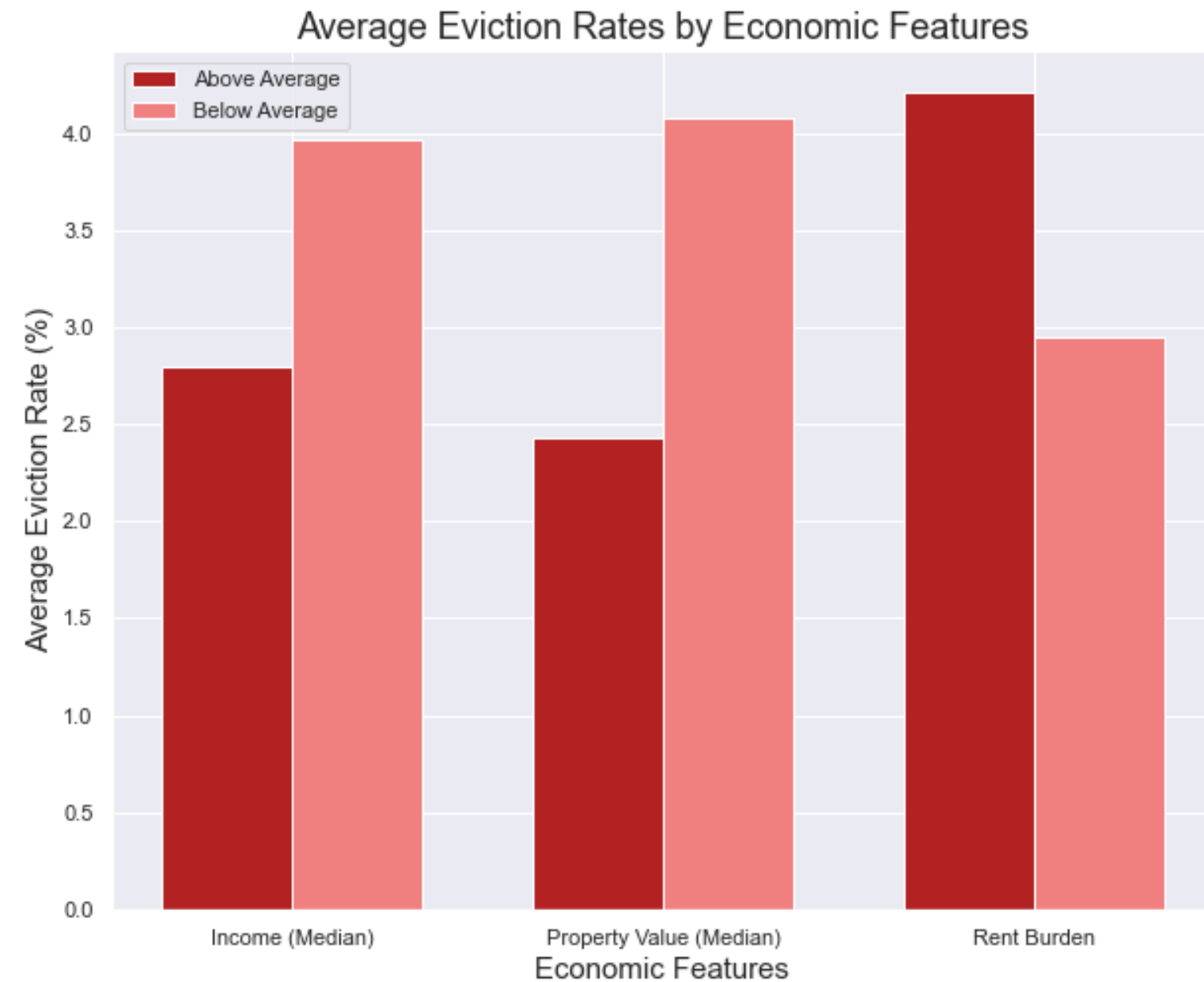
# Data Exploration

- Female majorities have tend to have higher eviction rates than male majorities



# Data Exploration

- Census tracts with below average incomes and property values have higher average eviction rates
- Census tracts with above average rent burden have higher average eviction rates



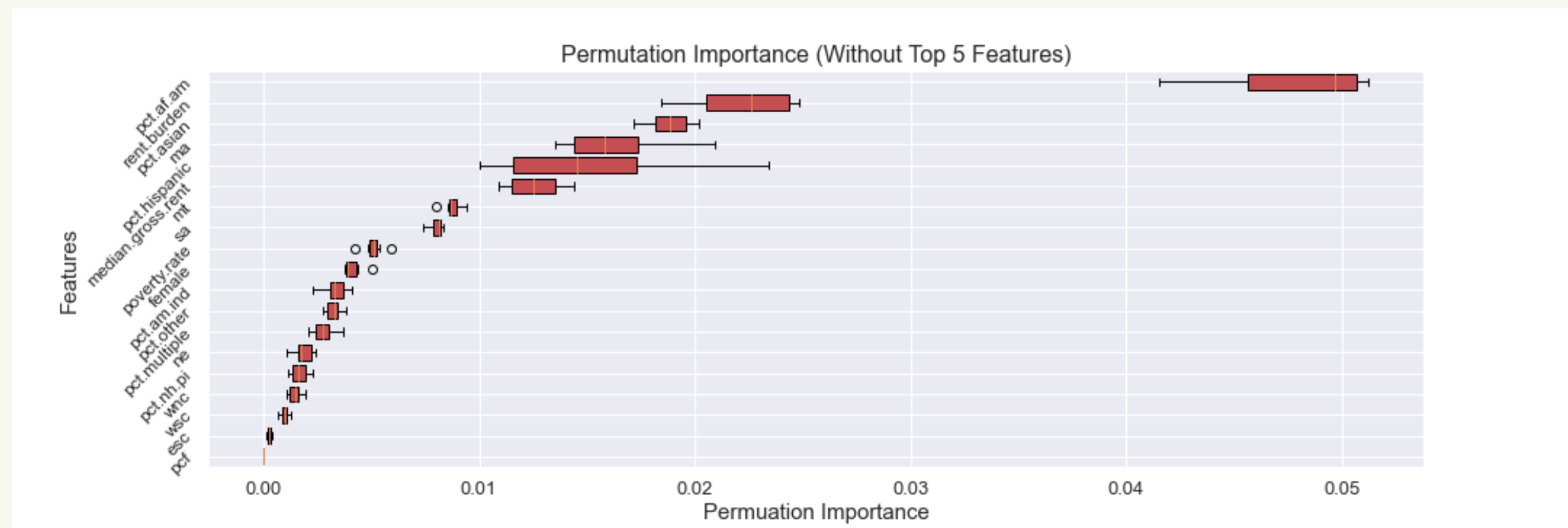
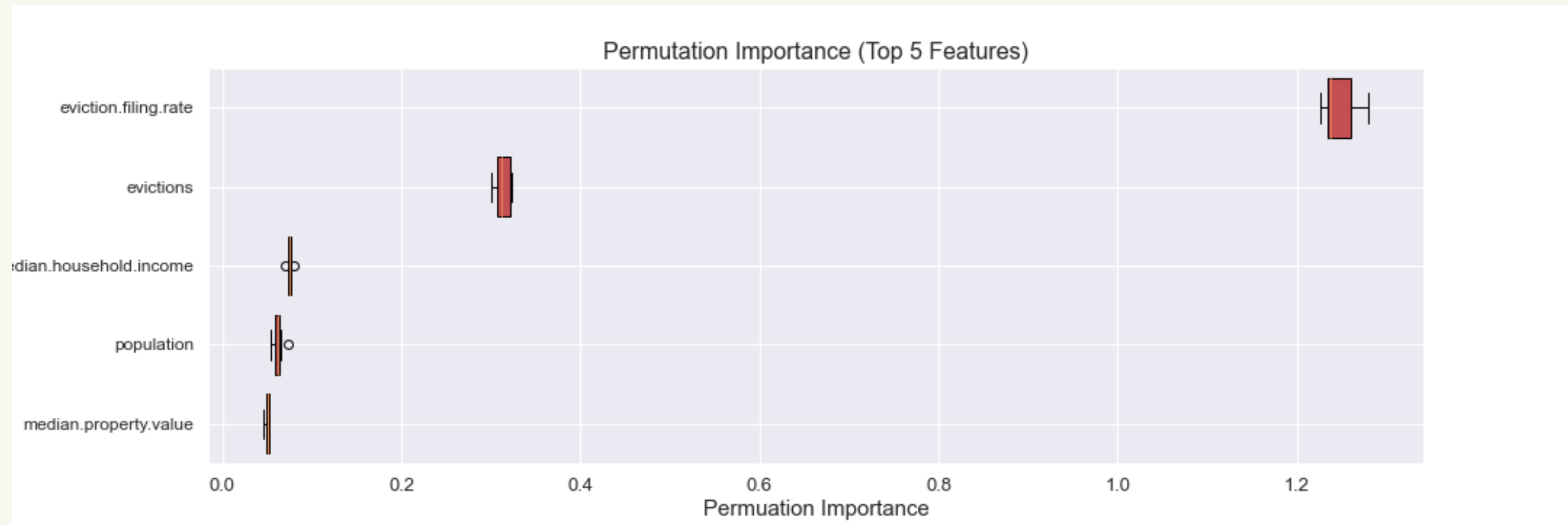
# Final Model

- XGBoost
  - IsolationForest
- $R^2 = 0.9435$
- $RMSE = 0.8191$

## Important Features

1. Eviction Filing Rate
2. # Evictions
3. Median Household Income
4. Population
5. Median Property Value





# Next Steps

- Evaluate and train the model on data collected from 2017 to present
- Incorporate additional features
  - crime rates, gov. services utilized, etc.
- Conduct time series analysis
- **NOTE:** Given the timeframe of the available data from the Eviction Lab (up to 2016), data related to the COVID-19 pandemic is irrelevant for analysis
- It is likely that analysis from 2020 and 2021 will be impacted by interventions such as eviction moratoriums



# THANK YOU



[jmannix15@gmail.com](mailto:jmannix15@gmail.com)



[github.com/HughJackmannix](https://github.com/HughJackmannix)



[linkedin.com/jackrmannix](https://linkedin.com/jackrmannix)