

# NYC Opportunity Assessment

Camilla Zhang

2023-01-12

```
# Load data #  
df = read.csv("/Users/jayzee/Documents/nyc_opportunity_assessment/data/renters_data_ct.csv")
```

```
# Import Libraries #  
#install.packages("estimatr")  
library(estimatr)  
#install.packages("outliers")  
library(outliers)
```

```
#Rename columns  
colnames(df)[5] = "median_rooms" #rename median rooms  
colnames(df)[6] = "no_plumbing" #Rename lacking plumbing facilities  
colnames(df)[7] = "no_kitchen" #Rename lacking kitchen  
  
#lowercase all column names  
names(df) <- tolower(names(df))
```

###Conduct Grubbs test to check for outliers (lower p-value shows that the lowest/highest values are outliers (alternative hypothesis))

```
# Race/ethnicity tests  
grubbs.test(df$asian)
```

```
##  
## Grubbs test for one outlier  
##  
## data: df$asian  
## G = 16.92301, U = 0.74856, p-value < 2.2e-16  
## alternative hypothesis: highest value 3358 is an outlier
```

```
grubbs.test(df$black.or.african.american)
```

```
##  
## Grubbs test for one outlier  
##  
## data: df$black.or.african.american  
## G = 4.62181, U = 0.98125, p-value = 0.001962  
## alternative hypothesis: highest value 1999 is an outlier
```

```

grubbs.test(df$hispanic.or.latino.origin)

##
## Grubbs test for one outlier
##
## data: df$hispanic.or.latino.origin
## G = 6.63362, U = 0.96137, p-value = 1.209e-08
## alternative hypothesis: highest value 3194 is an outlier

#Education tests
grubbs.test(df$less.than.high.school graduate)

##
## Grubbs test for one outlier
##
## data: df$less.than.high.school graduate
## G = 8.17281, U = 0.94136, p-value < 2.2e-16
## alternative hypothesis: highest value 2038 is an outlier

grubbs.test(df$high.school graduate..includes.equivalency.)

##
## Grubbs test for one outlier
##
## data: df$high.school graduate..includes.equivalency.
## G = 6.92231, U = 0.95793, p-value = 1.51e-09
## alternative hypothesis: highest value 1674 is an outlier

```

## Robust Clustered SE Regression

```

robust_lm <- estimatr::lm_robust(
  evictions ~
    borough +
    median_rooms +
    no_plumbing +
    asian +
    black.or.african.american +
    white.alone..not.hispanic.or.latino +
    hispanic.or.latino.origin +
    less.than.high.school graduate +
    high.school graduate..includes.equivalency. +
    some.college.or.associate.s.degree +
    moved.in.2019.or.later +
    moved.in.2015.to.2018,
  data = df,
  se_type = "HC0"
)
summary(robust_lm)

```

```
##
## Call:
## estimatr::lm_robust(formula = evictions ~ borough + median_rooms +
##   no_plumbing + asian + black.or.african.american + white.alone..not.hispanic.or.latino +
##   hispanic.or.latino.origin + less.than.high.school.graduate +
##   high.school.graduate..includes.equivalency. + some.college.or.associate.s.degree +
##   moved.in.2019.or.later + moved.in.2015.to.2018, data = df,
##
## Standard error type: HCO
##
## Coefficients:
```

	Estimate	Std. Error	t value
(Intercept)	62.235654	11.526928	5.3992
boroughbrooklyn	-25.639642	4.299572	-5.9633
boroughmanhattan	-24.708894	5.887644	-4.1967
boroughqueens	-25.808583	4.242391	-6.0835
boroughstaten island	-23.820755	5.915012	-4.0272
median_rooms1.3	72.699916	11.815304	6.1530
median_rooms2.0	55.088069	23.045329	2.3904
median_rooms2.2	-65.624024	22.725912	-2.8876
median_rooms2.3	-46.456727	13.079825	-3.5518
median_rooms2.4	-48.364899	12.205290	-3.9626
median_rooms2.5	5.147096	21.204938	0.2427
median_rooms2.6	-33.696310	16.432369	-2.0506
median_rooms2.7	-10.423527	15.368252	-0.6783
median_rooms2.8	-6.450469	24.099049	-0.2677
median_rooms2.9	-22.996908	14.520957	-1.5837
median_rooms3.0	-13.902334	14.995981	-0.9271
median_rooms3.1	-27.685978	13.485610	-2.0530
median_rooms3.2	-31.749320	13.517117	-2.3488
median_rooms3.3	-23.692250	12.999434	-1.8226
median_rooms3.4	-31.876981	12.066658	-2.6417
median_rooms3.5	-31.755664	12.109845	-2.6223
median_rooms3.6	-24.601557	12.438017	-1.9779
median_rooms3.7	-35.433385	12.015796	-2.9489
median_rooms3.8	-12.318967	12.489004	-0.9864
median_rooms3.9	-24.766990	12.299862	-2.0136
median_rooms4.0	-26.526282	12.658479	-2.0955
median_rooms4.1	-33.368290	12.919180	-2.5828
median_rooms4.2	-29.798473	11.671859	-2.5530
median_rooms4.3	-38.150396	11.638728	-3.2779
median_rooms4.4	-24.428216	11.986942	-2.0379
median_rooms4.5	-21.446262	13.219666	-1.6223
median_rooms4.6	-33.163372	11.498380	-2.8842
median_rooms4.7	-25.557050	12.473529	-2.0489
median_rooms4.8	-28.909206	11.671870	-2.4768
median_rooms4.9	-25.457423	11.667351	-2.1819
median_rooms5.0	-25.265145	11.916238	-2.1202
median_rooms5.1	-25.501811	12.390973	-2.0581
median_rooms5.2	-37.379133	11.437719	-3.2681
median_rooms5.3	-25.654142	12.626625	-2.0317
median_rooms5.4	-21.114521	13.961079	-1.5124
median_rooms5.5	-27.267654	13.114174	-2.0793
median_rooms5.6	-28.011340	11.785354	-2.3768

## median_rooms5.7	-28.329605	11.386180	-2.4881
## median_rooms5.8	-29.406408	11.620186	-2.5306
## median_rooms5.9	-12.503224	16.595048	-0.7534
## median_rooms6.0	-33.711668	11.516707	-2.9272
## median_rooms6.1	-35.982646	11.684330	-3.0796
## median_rooms6.2	-22.033065	13.824478	-1.5938
## median_rooms6.3	-24.887209	12.112984	-2.0546
## median_rooms6.4	-32.971933	12.049774	-2.7363
## median_rooms6.5	-33.799720	10.938743	-3.0899
## median_rooms6.6	-22.707191	11.225392	-2.0228
## median_rooms6.7	3.952325	29.942901	0.1320
## median_rooms6.8	-35.956906	10.861097	-3.3106
## median_rooms6.9	-31.704733	10.923569	-2.9024
## median_rooms7.0	-34.803622	11.041598	-3.1520
## median_rooms7.2	-39.020542	10.902290	-3.5791
## no_plumbing	-0.031998	0.055634	-0.5752
## asian	-0.019242	0.010887	-1.7675
## black.or.african.american	0.033784	0.008755	3.8588
## white.alone..not.hispanic.or.latino	-0.013557	0.006521	-2.0790
## hispanic.or.latino.origin	0.030593	0.010286	2.9742
## less.than.high.school.graduate	0.009680	0.014041	0.6894
## high.school.graduate..includes.equivalency.	-0.005649	0.011454	-0.4932
## some.college.or.associate.s.degree	0.021726	0.013598	1.5978
## moved.in.2019.or.later	0.042460	0.018094	2.3466
## moved.in.2015.to.2018	0.037564	0.011254	3.3379
##	Pr(> t )	CI Lower	CI Upper
## (Intercept)	8.240e-08	3.962e+01	8.485e+01
## boroughbrooklyn	3.351e-09	-3.408e+01	-1.720e+01
## boroughmanhattan	2.932e-05	-3.626e+01	-1.316e+01
## boroughqueens	1.633e-09	-3.413e+01	-1.748e+01
## boroughstaten island	6.042e-05	-3.543e+01	-1.221e+01
## median_rooms1.3	1.071e-09	4.952e+01	9.588e+01
## median_rooms2.0	1.700e-02	9.869e+00	1.003e+02
## median_rooms2.2	3.959e-03	-1.102e+02	-2.103e+01
## median_rooms2.3	3.992e-04	-7.212e+01	-2.079e+01
## median_rooms2.4	7.903e-05	-7.231e+01	-2.442e+01
## median_rooms2.5	8.083e-01	-3.646e+01	4.675e+01
## median_rooms2.6	4.055e-02	-6.594e+01	-1.453e+00
## median_rooms2.7	4.978e-01	-4.058e+01	1.973e+01
## median_rooms2.8	7.890e-01	-5.374e+01	4.084e+01
## median_rooms2.9	1.136e-01	-5.149e+01	5.496e+00
## median_rooms3.0	3.541e-01	-4.333e+01	1.552e+01
## median_rooms3.1	4.031e-02	-5.415e+01	-1.225e+00
## median_rooms3.2	1.901e-02	-5.827e+01	-5.226e+00
## median_rooms3.3	6.865e-02	-4.920e+01	1.815e+00
## median_rooms3.4	8.368e-03	-5.555e+01	-8.200e+00
## median_rooms3.5	8.857e-03	-5.552e+01	-7.994e+00
## median_rooms3.6	4.819e-02	-4.901e+01	-1.960e-01
## median_rooms3.7	3.258e-03	-5.901e+01	-1.186e+01
## median_rooms3.8	3.242e-01	-3.682e+01	1.219e+01
## median_rooms3.9	4.430e-02	-4.890e+01	-6.325e-01
## median_rooms4.0	3.636e-02	-5.136e+01	-1.688e+00
## median_rooms4.1	9.930e-03	-5.872e+01	-8.019e+00
## median_rooms4.2	1.082e-02	-5.270e+01	-6.896e+00

## median_rooms4.3	1.079e-03	-6.099e+01	-1.531e+01
## median_rooms4.4	4.180e-02	-4.795e+01	-9.077e-01
## median_rooms4.5	1.050e-01	-4.739e+01	4.493e+00
## median_rooms4.6	4.003e-03	-5.573e+01	-1.060e+01
## median_rooms4.7	4.071e-02	-5.003e+01	-1.082e+00
## median_rooms4.8	1.341e-02	-5.181e+01	-6.007e+00
## median_rooms4.9	2.933e-02	-4.835e+01	-2.564e+00
## median_rooms5.0	3.422e-02	-4.865e+01	-1.883e+00
## median_rooms5.1	3.982e-02	-4.982e+01	-1.189e+00
## median_rooms5.2	1.117e-03	-5.982e+01	-1.494e+01
## median_rooms5.3	4.242e-02	-5.043e+01	-8.785e-01
## median_rooms5.4	1.307e-01	-4.851e+01	6.280e+00
## median_rooms5.5	3.783e-02	-5.300e+01	-1.535e+00
## median_rooms5.6	1.764e-02	-5.114e+01	-4.886e+00
## median_rooms5.7	1.299e-02	-5.067e+01	-5.988e+00
## median_rooms5.8	1.153e-02	-5.221e+01	-6.606e+00
## median_rooms5.9	4.514e-01	-4.507e+01	2.006e+01
## median_rooms6.0	3.492e-03	-5.631e+01	-1.111e+01
## median_rooms6.1	2.126e-03	-5.891e+01	-1.306e+01
## median_rooms6.2	1.113e-01	-4.916e+01	5.093e+00
## median_rooms6.3	4.016e-02	-4.866e+01	-1.119e+00
## median_rooms6.4	6.316e-03	-5.662e+01	-9.328e+00
## median_rooms6.5	2.054e-03	-5.526e+01	-1.234e+01
## median_rooms6.6	4.334e-02	-4.473e+01	-6.810e-01
## median_rooms6.7	8.950e-01	-5.480e+01	6.271e+01
## median_rooms6.8	9.619e-04	-5.727e+01	-1.465e+01
## median_rooms6.9	3.779e-03	-5.314e+01	-1.027e+01
## median_rooms7.0	1.666e-03	-5.647e+01	-1.314e+01
## median_rooms7.2	3.602e-04	-6.041e+01	-1.763e+01
## no_plumbing	5.653e-01	-1.412e-01	7.717e-02
## asian	7.744e-02	-4.060e-02	2.120e-03
## black.or.african.american	1.208e-04	1.660e-02	5.096e-02
## white.alone..not.hispanic.or.latino	3.785e-02	-2.635e-02	-7.618e-04
## hispanic.or.latino.origin	3.003e-03	1.041e-02	5.078e-02
## less.than.high.school.graduate	4.907e-01	-1.787e-02	3.723e-02
## high.school.graduate..includes.equivalency.	6.220e-01	-2.812e-02	1.683e-02
## some.college.or.associate.s.degree	1.104e-01	-4.955e-03	4.841e-02
## moved.in.2019.or.later	1.913e-02	6.956e-03	7.796e-02
## moved.in.2015.to.2018	8.730e-04	1.548e-02	5.965e-02
##	DF		
## (Intercept)	1074		
## boroughbrooklyn	1074		
## boroughmanhattan	1074		
## boroughqueens	1074		
## boroughstaten island	1074		
## median_rooms1.3	1074		
## median_rooms2.0	1074		
## median_rooms2.2	1074		
## median_rooms2.3	1074		
## median_rooms2.4	1074		
## median_rooms2.5	1074		
## median_rooms2.6	1074		
## median_rooms2.7	1074		
## median_rooms2.8	1074		

## median_rooms2.9	1074
## median_rooms3.0	1074
## median_rooms3.1	1074
## median_rooms3.2	1074
## median_rooms3.3	1074
## median_rooms3.4	1074
## median_rooms3.5	1074
## median_rooms3.6	1074
## median_rooms3.7	1074
## median_rooms3.8	1074
## median_rooms3.9	1074
## median_rooms4.0	1074
## median_rooms4.1	1074
## median_rooms4.2	1074
## median_rooms4.3	1074
## median_rooms4.4	1074
## median_rooms4.5	1074
## median_rooms4.6	1074
## median_rooms4.7	1074
## median_rooms4.8	1074
## median_rooms4.9	1074
## median_rooms5.0	1074
## median_rooms5.1	1074
## median_rooms5.2	1074
## median_rooms5.3	1074
## median_rooms5.4	1074
## median_rooms5.5	1074
## median_rooms5.6	1074
## median_rooms5.7	1074
## median_rooms5.8	1074
## median_rooms5.9	1074
## median_rooms6.0	1074
## median_rooms6.1	1074
## median_rooms6.2	1074
## median_rooms6.3	1074
## median_rooms6.4	1074
## median_rooms6.5	1074
## median_rooms6.6	1074
## median_rooms6.7	1074
## median_rooms6.8	1074
## median_rooms6.9	1074
## median_rooms7.0	1074
## median_rooms7.2	1074
## no_plumbing	1074
## asian	1074
## black.or.african.american	1074
## white.alone..not.hispanic.or.latino	1074
## hispanic.or.latino.origin	1074
## less.than.high.school.graduate	1074
## high.school.graduate..includes.equivalency.	1074
## some.college.or.associate.s.degree	1074
## moved.in.2019.or.later	1074
## moved.in.2015.to.2018	1074
##	

```
## Multiple R-squared:  0.5764 ,    Adjusted R-squared:  0.5504  
## F-statistic:      NA on 66 and 1074 DF,  p-value: NA
```