

# **Comparing low income housing in New Jersey with Tennessee and Illinois**

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## **Summary**

There are statistical differences between household incomes and low-income housing offered in New Jersey compared to Tennessee and Illinois. Incomes are by far the highest in New Jersey, followed by Illinois, and then Tennessee. Property values are higher in New Jersey than the other two states even when accounting for differences in income, where New Jersey's 50th percentile for household income earns about the same as Tennessee's 75th percentile and Illinois's 60th percentile, while New Jersey's 50th percentile for single-family owner-occupied home values and rental rates are about the same as Tennessee's 85th percentile and Illinois's 70th percentile. The distribution of the percentile-percentile plots for rental rates are almost identical to the distribution of home values, implying that rents are relatively similar to the home values in each state.

The percentage of low income families was highest in New Jersey, followed by Tennessee and Illinois. The percentage of new housing that is affordable, uncrowded and occupied by low-income families, as well as the percentage of new housing occupied by low-income families that is affordable and uncrowded, was highest in Tennessee, followed by Illinois and New Jersey.

Affordability of housing was most influenced by whether a household had income above the median or not and whether the household's rent was above the median or not. Income above the median was best predicted by whether the household had affordable housing and whether their rent was above the median. The third best predictor of high income was the education level of the head of the household.

## I. Introduction

As part of the 2010 Census, the populations and properties of New Jersey, Tennessee, and Illinois were surveyed for information about property types, finances, and personal living arrangements. The survey gathered information about family and household income, property values, housing expenses, and other related questions.

In this report, we compare the overall quality and availability of low-income<sup>1</sup> housing options between the three states New Jersey, Tennessee, and Illinois. We measure quality of low-income housing using three metrics; newness, affordability, and crowdedness. A unit is *affordable* if the percent of household income going towards housing expenses is less than 30%. A unit is considered *new* if it was built in the last ten years and finally a unit is considered *uncrowded* if the number of occupants is less than or equal to the number of rooms in the unit.

First, we performed pairwise comparisons of the three states': i) Income Distributions; ii) Household values; iii) Distribution of Rents; and iv) Property Values using percentile-percentile plots. We inspected these plots noting differences in the distribution, spread, and level of each variable, specifically paying attention to the difference between New Jersey and the other two states. Included in the appendix are percentile-percentile plots for each of the four variables first comparing New Jersey with Illinois, and secondly comparing New Jersey with Tennessee. Observations where information was not available are excluded from this analysis.

Then we calculated statistics summarizing the quality and availability of low-income housing in the three states. We calculated the following: median income, the percentage of families that are considered low-income, the percentage of new housing that is affordable, uncrowded and occupied by low-income families, and finally the percentage of new housing occupied by low-income families that is affordable and uncrowded. These metrics were calculated by state and then by PUMA1 sampling region. The metrics were analyzed for significant differences and trends between states and regions.

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<sup>1</sup> See Appendix Table 1 for information on the determination of low-income status.

Finally, we used logistic regression to explain the affordability of housing units within each state, evaluating rental units and owner-occupied units separately. We ran multiple logistic regressions for each state eliminating units where none of the household's income went towards housing expenses. Insignificant and unneeded variables were omitted as necessary and we also ran regressions GLMnet Lasso variable selection algorithms to obtain four models per state.

Results were deemed significant at  $p < .05$ .

## II. Results

### A. Percentile-Percentile Plot comparisons between states

New Jersey's income is higher than both Illinois and Tennessee at almost every percentile. The plot of household income between New Jersey and Illinois is concave down, where a straight line relationship would represent an almost equivalent income distribution. This concavity represents New Jersey's higher income across percentiles, while the plot of household income between New Jersey and Tennessee's concavity is even more pronounced. New Jersey's 50th percentile for household income earns about the same as Tennessee's 75th percentile and Illinois's 60th percentile. The distribution of incomes of New Jersey households that own their own property are even more extreme than for all income earners when compared to Illinois and Tennessee, with New Jersey's 50th percentile earning the same as Illinois's 65th and Tennessee's 80th. New Jersey

New Jersey's income is much greater than Tennessee and greater than Illinois while the plots for home values for owner occupied single-family homes and rental rates are similarly distributed between the three states. The plots for home values and rental rates are noticeably concave down when comparing Illinois to New Jersey, and extremely concave when comparing Tennessee and New Jersey. New Jersey's 50th percentile for single-family owner-occupied home values is about the same as

Tennessee's 85th percentile and Illinois's 70th percentile. This means that property values are relatively higher in New Jersey than the other two states even when accounting for differences in income.

The distribution of the percentile-percentile plots for rental rates are almost identical to the distribution of home values, implying that the distribution of rents is relatively similar to that of home values in each state.

## **B. Summary Statistics of Low-Income Families and Available Housing**

The median income in New Jersey was highest, followed by Illinois and Tennessee, with \$56,343, \$46,100, and \$36,100, respectively. The percentage of low income families was highest in New Jersey, followed closely by Tennessee and Illinois, with 25.09%, 23.81%, and 23.52%, respectively. The percentage of new housing that is affordable, uncrowded and occupied by low-income families was highest in Tennessee, followed by Illinois and New Jersey, with 8.06%, 6.04%, and 5.70%, respectively. Similarly, the percentage of new housing occupied by low-income families that is affordable and uncrowded was highest in Tennessee, followed by Illinois and New Jersey, with 40.00%, 38.38%, and 31.25%, respectively. See Table 1 of the appendix.

Looking at the PUMA regions for each state, we see that New Jersey has three regions with median income over \$70,000 (with \$78,000, \$77300, and \$70700), while Illinois has two (\$73,900 and \$71,000). The highest regions in Tennessee have median income of \$51,900 and \$51,000.

Tennessee had the region with the lowest median income, with \$28,785, which has 32.49% low-income families, 14.53% new housing that is affordable, uncrowded and occupied by low-income families, and 45.89% of new housing occupied by low-income families that is affordable and uncrowded. The region with the lowest median income in Illinois makes \$33,300, which has 33.37% low-income families, 5.85% new housing that is affordable, uncrowded and occupied by low-income families, and 18.10% of new housing occupied by low-income families that is affordable and uncrowded. The region with the lowest median income in New Jersey makes \$41,000, which has 36.51% low-income families, 8.75% new housing that is affordable, uncrowded and occupied by low-income families, and 30.11% of new housing occupied by low-income families that is affordable and uncrowded.

There appears to be a negative correlation between median income for each region and its percentage of low income families.

### C. Logistic Regression Models

We explored our data using logistic regression models. All data can be found in the appendix. Our first model has affordability as the response variable and explanatory variables that relate to occupants. Complete regression is modeled as:

$$\text{AFFORDABLE} \sim \text{PERSONS} + \text{UNCROWDED} + \text{SEX} + \text{AGE} + \text{RENTH} + \text{EDUG} + \text{ROOMS} + \text{BLDGSZ} + \text{VEHICL} + \text{HINCH}$$

We use this first model to find differences between states and between owners and renters. RENTH is not included for housing that is owner occupied, as RENTH is based on the GRAPI variable and was zero for owner occupied housing (these instances had number greater than zero for SMOCAP instead).

Upon reviewing the data, we notice extremely low p-values for most of our coefficients, meaning they are highly significant. The only coefficients that do not have significant p-values are in our Tennessee owner occupied model (BLDGSZ and UNCROWDED). The remaining coefficients for all states have p-values ranging from .021 to 2E-16. We can conclude that our logistic regression model provides a “good fit” of regressors to affordability.

We first review how RENTH (high rent-rent above median) and HINCH (high income-income above the median) affect our affordability. Since these variables are directly related to income and rent expense, we expect these variables to have a large effect on our response variable. High rent had a large negative effect on affordability (coefficients: Illinois: -2.51; New Jersey: -2.62; Tennessee: -2.92). High income had a large positive effect on affordability among owners and renters in Illinois and Tennessee (Illinois: 2.12 for owners, 4.53 for renters; Tennessee: 2.38 for owners, 5.02 for renters). Curiously, high income in New Jersey only had a strong effect on affordability for owners (2.482). For renters in New Jersey, the coefficient for HINCH is 0.053.

Across all states, the age of the head of household had almost no effect on affordability. The strongest coefficient for age regressors was 0.020 as seen for Tennessee owner occupied housing. Education (EDUG) also had a small effect on affordability with coefficients ranging from -0.094 (Tennessee renter occupied) to 0.113 (New Jersey renter occupied). Additionally number of occupants (PERSONS variable) also had a limited effect on affordability. Coefficients ranged from -0.050 (New Jersey owner occupied) to 0.083 (Tennessee renter occupied).

The gender of the head of household (SEX) and the number of vehicles owned by the household (VEHICL) also had an effect on affordability of housing across all states and occupancies.

Gender had a negative effect with coefficients ranging from -0.202 for New Jersey renters to -0.300 for Illinois owners. Number of vehicles had a positive effect with coefficients ranging from coefficients 0.148 (New Jersey renters) to 0.264 (Illinois renters).

Our next model was similar to model 1, but used affordability in addition to our previous regressors to predict high income. Specifically, we looked at:

$$\text{HINCH} \sim \text{PERSONS} + \text{UNCROWDED} + \text{SEX} + \text{AGE} + \text{RENTH} + \text{EDUG} + \text{ROOMS} + \text{BLDGSZ} + \text{VEHICL} + \text{AFFORDABLE}$$

Similarly, RENTH was only included in the renter model, not the owner occupied model.

For owner occupied housing, our UNCROWDED coefficient was not significant for Illinois or New Jersey. Also, BLDGSZ for Tennessee renter occupied housing was just outside the significance level ( $p=0.0510$ ). Otherwise, coefficients were very significant, ranging from 0.048 to 2E-16.

Affordable housing (AFFORDABLE) had a strong positive effect on our response variable , High Income. For owner occupied housing, our coefficients were 2.222 for Illinois, 2.639 for New Jersey, and 2.532 for Tennessee. Coefficients were twice as large for renter occupied housing with 4.556 for Illinois, 5.140 for New Jersey, and 5.023 for Tennessee.

In both owner occupied and renter occupied models, AFFORDABLE is the strongest predictor of high income, though high rent (RENTH) and Education (EDUG) also have a strong effect on whether a household is high income (HINCH). Coefficients for high rent are similar across all state with values of 2.790 for Illinois, 2.791 for New Jersey, and 3.119 for Tennessee. Education had a higher effect on affordability for owners than renters across all states. For renters, coefficients were 0.683 for Illinois, 0.810 for New Jersey, and 0.842 for Tennessee. For owners, coefficients were 1.080 for Illinois, 1.201 for New Jersey, and 1.172 for Tennessee.

Number of vehicles and gender of head of household also has a strong effect across all states. Coefficients for the VEHICL predictor were similar between states and between owners and renters. Coefficients for owners and renters, respectively, were 0.435 and 0.446 for Illinois, 0.558 and 0.503 for New Jersey, and 0.432 and 0.499 for Tennessee. Gender of head of household (SEX) had a stronger effect on our response variable of high income than it did in model one when our response variable was affordability. Coefficients for model 2 SEX predictor were, for owners and renters, respectively, -0.550 and -0.631 for Illinois, -0.409 and -0.570 for New Jersey, and -0.652 and -0.623 for Tennessee.

As in our first model, age of head of household has a small effect, though it's effect is stronger than in model 1. Building size (BLDGSZ) was a stronger predictor of high income for owners than for

renters by an order of magnitude across. For renters BLDGSZ has almost no effect on our response variable, HINCH, but for owners, coefficients were 0.219 for Illinois, 0.101 for New Jersey, and 0.256 for Tennessee.

Our third model used the number of occupants and whether the home was uncrowded (defined as total occupants being less than or equal to total number of rooms) to predict affordability. The model used was:

$$\text{AFFORDABLE} \sim \text{PERSONS} + \text{UNCROWDED} + \text{RENTH}$$

Where RENTH was again removed for owner occupied housing. All logistic regression coefficients were highly significant, ranging from 1.5E-07 to 2E-16.

From model 3, our strongest predictor of whether housing is affordable is whether it is crowded or not. UNCROWDED coefficients were, for owners and renters, respectively, 0.929 and 0.313 for Illinois, 0.807 and 0.192 for New Jersey, and 0.836 and 0.462 for Tennessee. In all states, renter occupied housing had smaller coefficients for UNCROWDED than for owner occupied housing.

The number of people in a household (PERSONS) stayed similar through all states whether renting or owning. Coefficients ranged from .127 (Illinois owner occupied) to .206 (Tennessee renter occupied).

As with previous models high rent (RENTH) had a negative effect on affordability. Coefficients were -0.246 for Illinois, -0.142 for New Jersey, and -0.259 for Tennessee.

Our fourth model expanded on the third model to add variables for whether the housing was new and whether the occupants were low income. The model used was:

$$\text{AFFORDABLE} \sim \text{PERSONS} + \text{UNCROWDED} + \text{NEW\_CONSTRUCTION} + \text{LOW\_INC} + \text{RENTH}$$

Where RENTH was again removed for owner occupied housing. All logistic regression coefficients were significant with p-values between 0.047 and 2.00E-16.

The effect of low income (LOW\_INC) on our response variable (AFFORDABLE) was stable for owner occupied housing. Coefficients were -1.252 for Illinois, -1.523 for New Jersey, and -1.508 for Tennessee. Our coefficients for renter occupied housing were unrelated between states with Illinois at -0.276, New Jersey at 2.991, and Tennessee at -2.915. The vast differences are probably due to differences in housing policy between states.

High rent (RENTH) has a negative effect on affordability. Coefficients were -0.728 for Illinois, -0.658 for New Jersey, and -0.836 for Tennessee. New Construction (housing built within the past 10 years) was the least strong predictor in all three states. Our UNCROWDED regressor showed a

slight increase of effect on affordability from model 3 (though there is a slight decrease for owner occupied housing in New Jersey.). Total occupants (PEOPLE) increase in all states and living situations. Values now range from 0.197 to 0.641.

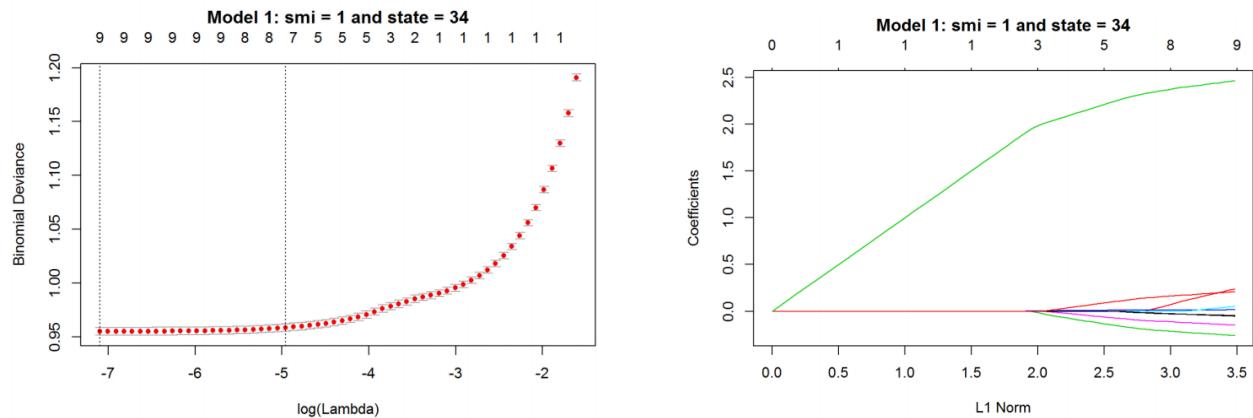
Finally, we used GLMnet's Lasso algorithm on our logistic regression models. For our first model we used the following predictor variables: PERSONS, UNCROWDED, SEX, AGE, RENTH, EDUG, ROOMS, BLDGSZ, VEHICL, HINCH. The response was AFFORDABLE. EDUG, RENTH and HINCH are the same as EDUC, GRENT, and Ihinc except that they are indicator variables whether the given unit was above or below the median cost for those variables (as specified by census definitions). A separate model was made for units where smi was equal to 1 as those models do not have a Household Rent (RENTH) variable. We can see in the following table that the EDUG variable is not significant for the model containing the RENTH variable (the first table), yet is significant when RENTH is removed (the following table). The following is for Illinois:

	Coefficients	PValues
(Intercept)	0.6407	0.0000
PERSONS	-0.0486	0.0000
UNCROWDED	0.1254	0.0000
SEX	-0.2527	0.0000
AGE	0.0130	0.0000
RENTH	-1.3300	0.0000
EDUG	-0.0071	0.4053
ROOMS	-0.1507	0.0000
BLDGSZ	-0.0723	0.0000
VEHICL	0.2276	0.0000
HINCH	2.8626	0.0000

After running glmnet using these variables, we see the following coefficients:

(Intercept)	0.169011	(Intercept)	0.43740
PERSONS	.	PERSONS	-0.01930
UNCROWDED	.	UNCROWDED	0.33756
SEX	-0.164499	SEX	-0.23766
AGE	.	AGE	0.01605
RENTH	-2.085024	EDUG	.
EDUG	0.006593	ROOMS	-0.11370
ROOMS	-0.002050	BLDGSZ	-0.09427
BLDGSZ	.	VEHICL	0.18114
VEHICL	0.163455	HINCH	1.94314
HINCH	4.124385		

After running a Lasso algorithm on the above models, most of the models contained significant coefficients and the models with more variables did not necessarily perform better than those without. This can be seen in the plots of binomial deviance. Not many of the graphs have to use many iterations to return an optimal lambda value. We can also see this in the plots showing the shrinkage. In most cases the variables converge to zero at a similar rate, as can be seen in New Jersey's Model 1 for owner occupied housing.



## D. Conclusions

There are statistical differences between the incomes, property values, and low-income housing offered in New Jersey compared to Tennessee and Illinois. Incomes are by far the highest in New Jersey, followed by Illinois, and then Tennessee. The percentage of low income families was highest in New Jersey, followed by Tennessee and Illinois. The percentage of new housing that is affordable, uncrowded and occupied by low-income families, as well as the percentage of new housing occupied by low-income families that is affordable and uncrowded, was highest in Tennessee, followed by Illinois and then New Jersey.

After running logistic regression models predicting the affordability of low-income housing, we can conclude that certain factors affect affordability and income more than others. The biggest effect on affordability was whether income was above the median (HINCH). This effect worked in reverse also with affordability of housing being the strongest predictor of income above the median. Education level also strongly predicted whether a household was high income.

We found an interesting relationship in our fourth model. Low income for renters in New Jersey was a strong positive predictor of affordable housing. This was the only case where the relationship was positive. In Illinois and Tennessee (and owner models for all 3 states), low income had a negative effect on affordability. The difference for New Jersey renters is most likely explained by housing policy in the state.

Model 1 and model 2 show that gender of the head of the household has a negative effect on affordability across all states and housing situations. More research would be needed to determine the true cause of this negative effect.

## Appendix

**Table 1. Determination of Low-Income Status**

Low-income is defined as follows using median income for a family of four occupying a single family household ( $m(4)$ ):

For a household of 2 persons Low income is below  $c(3) = 80\%$  of  $m(4)$

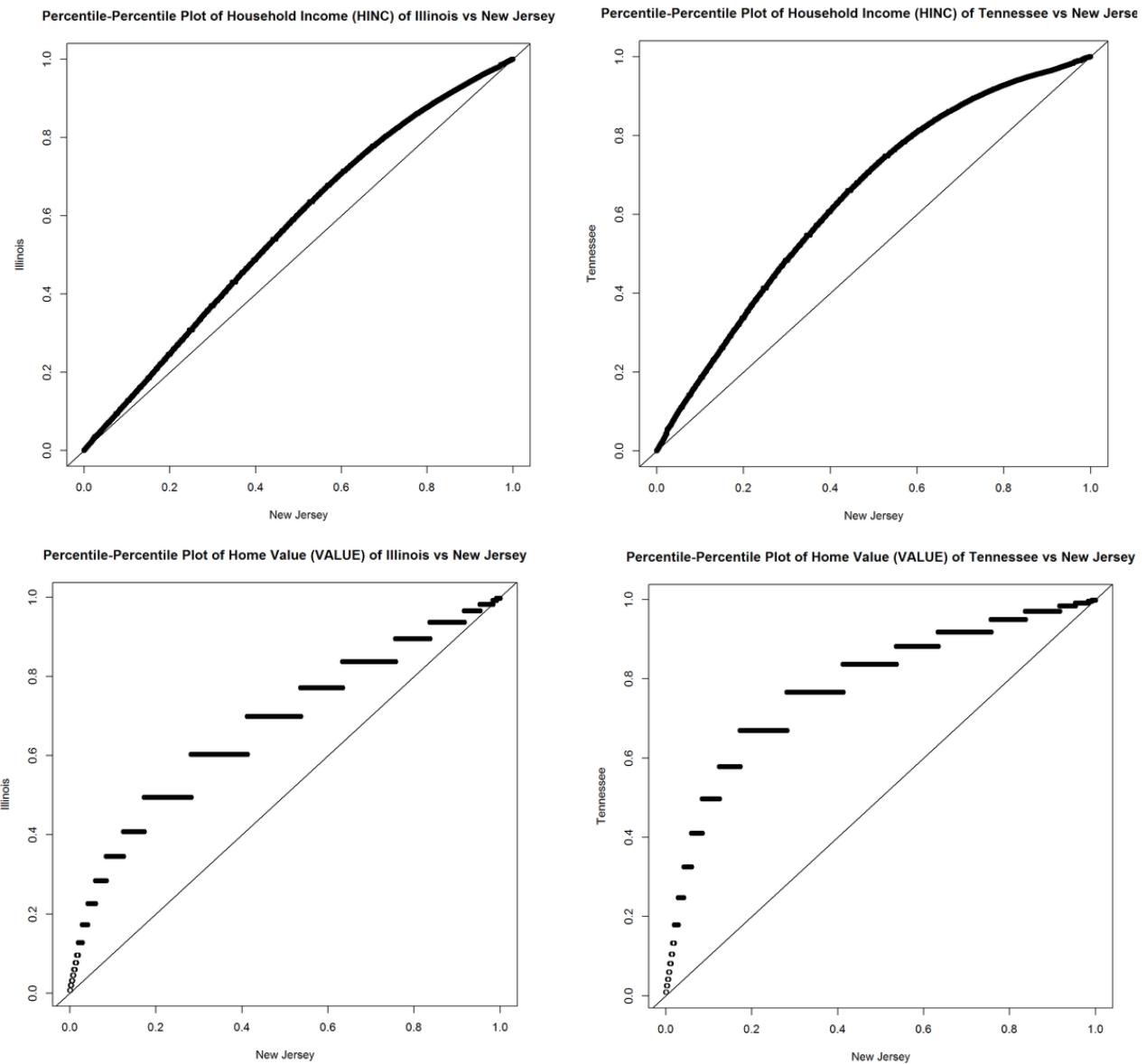
For a household of 3 persons Low income is below  $m(3) = 90\%$  of  $m(4)$

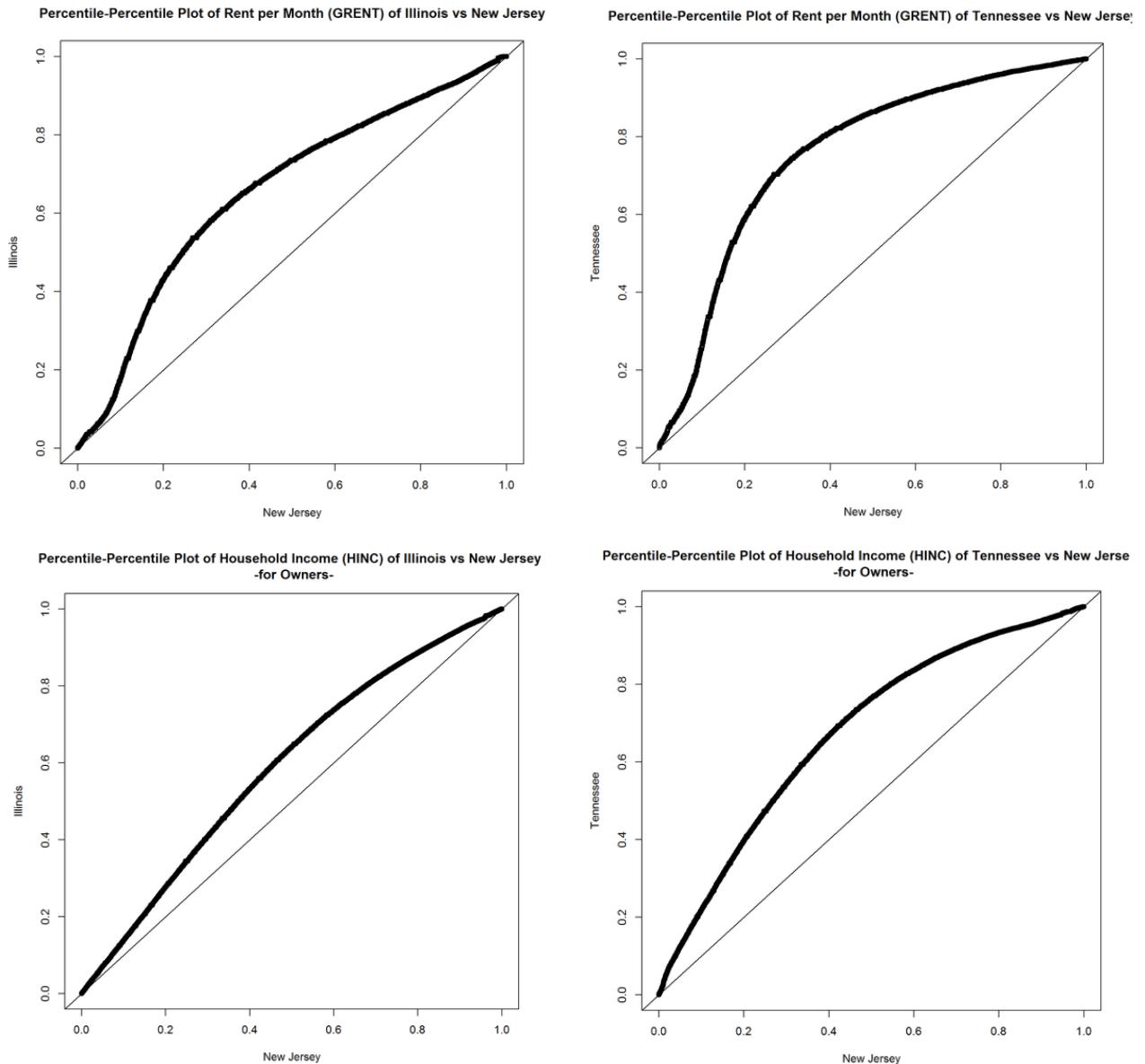
For a household of 4 persons Low income is below  $m(4) = 80\%$  of median

For a household of 5 persons Low income is below  $c(8) = 108\%$  of  $m(4)$

For a household of 6 persons Low income is below  $c(8) = 116\%$  of  $m(4)$

## Results A.Percentile-Percentile Plots





**Results B.Table 1. Summary Statistics of Key Low-Income Housing Metrics by State**

<u>STATE</u>	Median Income	% of Families that are <u>Low-Income</u>	% of New Housing that is Affordable, Uncrowded and <u>Low-Income</u>	% of New Low-Income Housing that is Affordable and <u>Uncrowded</u>
IL	46,100	23.52%	6.04%	38.38%
NJ	56,343	25.09%	5.70%	31.25%
TN	36,100	23.81%	8.06%	40.00%

**Results B.Table 2. Summary Statistics of Key Low-Income Housing Metrics by PUMA1**

<u>STATE</u>	<u>PUMA1</u>	Median Income	% of Families that are <u>Low-Income</u>	% of New Housing that is Affordable, Uncrowded and <u>Low-Income</u>	% of New Low-Income Housing that is Affordable and <u>Uncrowded</u>
IL	17040	42000	26.83%	8.00%	42.11%
IL	17050	41000	25.95%	8.73%	42.51%
IL	17060	45720	23.46%	6.08%	42.79%
IL	17070	40000	27.20%	8.83%	41.61%
IL	17080	45240	22.96%	5.55%	34.72%
IL	17090	62030	15.21%	1.82%	21.70%
IL	17100	60500	15.92%	2.78%	29.58%
IL	17201	73900	8.96%	1.45%	22.58%
IL	17202	63980	12.75%	1.48%	17.14%
IL	17300	71000	13.24%	1.70%	19.03%
IL	17401	62600	12.20%	1.73%	22.35%
IL	17402	67000	12.47%	3.24%	31.25%
IL	17403	48325	21.35%	3.24%	17.65%
IL	17404	53900	17.11%	4.13%	37.50%
IL	17405	48000	22.75%	4.47%	28.92%
IL	17501	45600	17.11%	1.56%	19.35%
IL	17502	46000	25.47%	5.39%	26.83%
IL	17503	37950	32.36%	5.79%	27.08%
IL	17504	33300	33.37%	5.85%	18.10%
IL	17505	40000	32.85%	17.54%	47.62%
NJ	34011	45000	32.56%	9.21%	36.36%
NJ	34012	50000	28.82%	5.21%	27.27%

NJ	34020	47400	27.42%	11.60%	48.35%
NJ	34030	65900	20.10%	2.70%	20.00%
NJ	34041	59795	24.25%	5.21%	30.39%
NJ	34042	63000	20.76%	3.87%	29.66%
NJ	34050	77300	14.54%	1.60%	18.25%
NJ	34060	48000	30.17%	12.30%	33.33%
NJ	34070	41000	36.51%	8.75%	30.11%
NJ	34080	57000	24.80%	6.80%	25.56%
NJ	34090	70700	17.53%	3.66%	29.46%
NJ	34101	58000	21.84%	5.00%	22.41%
NJ	34102	78000	16.72%	2.48%	16.85%
NJ	34110	49800	31.60%	5.00%	23.60%
NJ	34120	58700	23.23%	4.30%	29.95%
TN	47010	32000	27.66%	11.11%	43.53%
TN	47020	43795	19.12%	5.28%	33.74%
TN	47030	28785	32.49%	14.53%	45.89%
TN	47040	32000	27.18%	11.15%	45.84%
TN	47050	34000	26.38%	10.36%	43.67%
TN	47060	36500	21.67%	6.70%	37.97%
TN	47070	35000	25.18%	10.38%	44.23%
TN	47081	39355	17.27%	2.60%	20.13%
TN	47082	51900	13.77%	2.73%	27.15%
TN	47090	34200	26.16%	9.48%	40.60%
TN	47101	51000	16.49%	2.76%	27.31%
TN	47102	32000	25.78%	5.49%	25.22%

## Results C. Logistic Regression Models

### Model 1: Owner Occupied

#### Illinois Owner Occupied

	Coefficient	P-value
Intercept	0.524	7.10E-15
PERSONS	-0.046	1.10E-14
UNCROWDED	0.537	2.00E-16
SEX	-0.300	2.00E-16
AGE	0.018	2.00E-16
EDUG	-0.058	1.00E-04
ROOMS	0.162	2.00E-16
BLDGSZ	0.124	2.00E-16
VEHICL	0.241	2.00E-16
HINCH	2.123	2.00E-16

#### New Jersey Owner Occupied

	Coefficient	P-value
Intercept	0.134	1.30E-01
PERSONS	-0.050	6.10E-12
UNCROWDED	0.277	1.50E-05
SEX	-0.270	2.00E-16
AGE	0.016	2.00E-16
EDUG	0.065	3.30E-04
ROOMS	-0.157	2.00E-16
BLDGSZ	-0.059	2.00E-16
VEHICL	0.218	2.00E-16
HINCH	2.482	2.00E-16

#### Tennessee Owner Occupied

	Coefficient	P-value
Intercept	0.149	0.179
PERSONS	-0.008	4.05E-01
UNCROWDED	0.164	0.052
SEX	-0.288	2.00E-16
AGE	0.020	2.00E-16
EDUG	-0.041	6.00E-02
ROOMS	-0.134	2.00E-16
BLDGSZ	0.018	0.222
VEHICL	0.218	2.00E-16
HINCH	2.381	2.00E-16

**Model 1: Renter Occupied**

Illinois Renter Occupied		Coefficient	P-value
Intercept		-0.008	0.92994
PERSONS		0.021	0.06079
UNCROWDED		0.088	0.12598
SEX		-0.249	2.00E-16
AGE		0.003	4.00E-05
RENTH		-2.509	2.00E-16
EDUG		0.122	2.70E-06
ROOMS		-0.037	3.10E-04
BLDGSZ		0.019	0.001
VEHICL		0.264	2.00E-16
HINCH		4.527	2.00E-16
New Jersey Renter Occupied		Coefficient	P-value
Intercept		-0.344	0.00093
PERSONS		0.052	0.00014
UNCROWDED		0.193	0.002
SEX		-0.202	5.10E-13
AGE		-0.002	0.003
RENTH		-2.621	2.00E-16
EDUG		0.113	2.40E-04
ROOMS		-0.100	5.80E-16
BLDGSZ		0.083	2.00E-16
VEHICL		0.148	3.00E-16
HINCH		0.053	2.00E-16
Tennessee Renter Occupied		Coefficient	P-value
Intercept		-0.464	0.0011
PERSONS		0.083	3.40E-06
UNCROWDED		0.384	9.80E-05
SEX		-0.247	9.90E-12
AGE		0.005	2.30E-06
RENTH		-2.922	2.00E-16
EDUG		-0.094	0.021
ROOMS		-0.071	7.10E-06
BLDGSZ		0.049	8.30E-10
VEHICL		0.216	2.00E-16
HINCH		5.016	2.00E-16

## Model 2: Owner Occupied

### Illinois Owner Occupied

	Coefficient	P-value
Intercept	-4.937	2.00E-16
PERSONS	0.245	2.00E-16
UNCROWDED	0.042	0.36
SEX	-0.550	2.00E-16
AGE	-0.016	2.00E-16
EDUG	1.080	2.00E-16
ROOMS	0.327	2.00E-16
BLDGSZ	0.219	2.00E-16
VEHICL	0.435	2.00E-16
AFFORDABLE	2.222	2.00E-16

### New Jersey Owner Occupied

	Coefficient	P-value
Intercept	-4.940	2.00E-16
PERSONS	0.213	2.00E-16
UNCROWDED	0.072	0.28
SEX	-0.409	2.00E-16
AGE	-0.023	2.00E-16
EDUG	1.201	2.00E-16
ROOMS	0.334	2.00E-16
BLDGSZ	0.101	2.00E-16
VEHICL	0.558	2.00E-16
AFFORDABLE	2.639	2.00E-16

### Tennessee Owner Occupied

	Coefficient	P-value
Intercept	-5.367	2.00E-16
PERSONS	0.285	2.00E-16
UNCROWDED	0.303	1.50E-04
SEX	-0.652	2.00E-16
AGE	-0.019	2.00E-16
EDUG	1.172	2.00E-16
ROOMS	0.347	2.00E-16
BLDGSZ	0.256	2.00E-16
VEHICL	0.432	2.00E-16
AFFORDABLE	2.532	2.00E-16

## Model 2: Renter Occupied

### Illinois Renter Occupied

	Coefficient	P-value
Intercept	-5.199	2.00E-16
PERSONS	0.134	2.00E-16
UNCROWDED	-0.119	0.038
SEX	-0.631	2.00E-16
AGE	-0.002	0.020
RENTH	2.790	2.00E-16
EDUG	0.683	2.00E-16
ROOMS	0.139	0.011
BLDGSZ	0.016	2.00E-16
VEHICL	0.446	2.00E-16
AFFORDABLE	4.556	2.00E-16

### New Jersey Renter Occupied

	Coefficient	P-value
Intercept	-5.094	2.00E-16
PERSONS	0.146	2.00E-16
UNCROWDED	-0.175	5.10E-03
SEX	-0.570	2.00E-16
AGE	-0.007	1.70E-13
RENTH	2.791	2.00E-16
EDUG	0.810	2.00E-16
ROOMS	0.153	2.00E-16
BLDGSZ	-0.047	8.40E-10
VEHICL	0.503	2.00E-16
AFFORDABLE	5.140	2.00E-16

### Tennessee Renter Occupied

	Coefficient	P-value
Intercept	-5.462	2.00E-16
PERSONS	0.161	2.00E-16
UNCROWDED	-0.194	0.048
SEX	-0.623	2.00E-16
AGE	-0.003	0.024
RENTH	3.119	2.00E-16
EDUG	0.842	2.00E-16
ROOMS	0.123	3.60E-13
BLDGSZ	-0.017	0.0510
VEHICL	0.499	2.00E-16
AFFORDABLE	5.023	2.00E-16

### Model 3

#### Illinois Owner Occupied

	Coefficient	P-value
Intercept	0.117	0.0091
PERSONS	0.127	2.00E-16
UNCROWDED	0.929	2.00E-16

#### New Jersey Owner Occupied

	Coefficient	P-value
Intercept	-0.323	2.80E-08
PERSONS	0.169	2.00E-16
UNCROWDED	0.807	2.00E-16

#### Tennessee Owner Occupied

	Coefficient	P-value
Intercept	0.048	0.56
PERSONS	0.199	2.00E-16
UNCROWDED	0.836	2.00E-16

#### Illinois Renter Occupied

	Coefficient	P-value
Intercept	0.134	0.0023
PERSONS	0.142	2.00E-16
UNCROWDED	0.313	2.00E-16
RENTH	-0.246	2.00E-16

#### New Jersey Renter Occupied

	Coefficient	P-value
Intercept	0.043	0.35
PERSONS	0.146	2.00E-16
UNCROWDED	0.192	1.50E-07
RENTH	-0.142	4.70E-13

#### Tennessee Renter Occupied

	Coefficient	P-value
Intercept	0.183	0.013
PERSONS	0.206	2.00E-16
UNCROWDED	0.462	1.90E-13
RENTH	-0.259	2.00E-16

## Model 4: Owner Occupied

### Illinois Owner Occupied

	Coefficient	P-value
Intercept	0.302	1.30E-10
PERSONS	0.197	2.00E-16
UNCROWDED	1.033	2.00E-16
NEW_CONSTR	-0.441	2.00E-16
LOW_INC	-1.252	2.00E-16

### New Jersey Owner Occupied

	Coefficient	P-value
Intercept	0.009	8.90E-01
PERSONS	0.249	2.00E-16
UNCROWDED	0.780	2.00E-16
NEW_CONSTR	-0.193	2.00E-16
LOW_INC	-1.523	2.00E-16

### Tennessee Owner Occupied

	Coefficient	P-value
Intercept	0.259	2.90E-03
PERSONS	0.344	2.00E-16
UNCROWDED	0.897	2.00E-16
NEW_CONSTR	-0.443	2.00E-16
LOW_INC	-1.508	2.00E-16

## Model 4: Renter Occupied

### Illinois Renter Occupied

	Coefficient	P-value
Intercept	0.055	0.29
PERSONS	0.494	2.00E-16
UNCROWDED	0.529	2.00E-16
NEW_CONSTR	-0.167	2.00E-06
LOW_INC	-0.276	2.00E-16
RENTH	-0.728	2.00E-16

### New Jersey Renter Occupied

	Coefficient	P-value
Intercept	0.057	3.10E-01
PERSONS	0.524	2.00E-16
UNCROWDED	0.296	7.00E-11
NEW_CONSTR	-0.258	7.10E-10
LOW_INC	2.991	2.00E-16
RENTH	-0.658	2.00E-16

**Tennessee Renter Occupied**

	Coefficient	P-value
Intercept	-0.489	6.90E-08
PERSONS	0.641	2.00E-16
UNCROWDED	0.828	2.00E-16
NEW_CONSTR	0.077	0.047
LOW_INC	-2.915	2.00E-16
RENTH	-0.836	2.00E-16