



SACRAMENTO
STATE

Past Structural Racism and Present Home Prices*

A regression study to detect the consequences of the redlining practices of the Federal Homeowner Loan Corporation

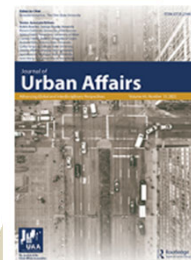
Robert W. Wassmer

Professor and Vice Chairperson
Department of Public Policy and Administration

Sacramento Economics Roundtable Presentation

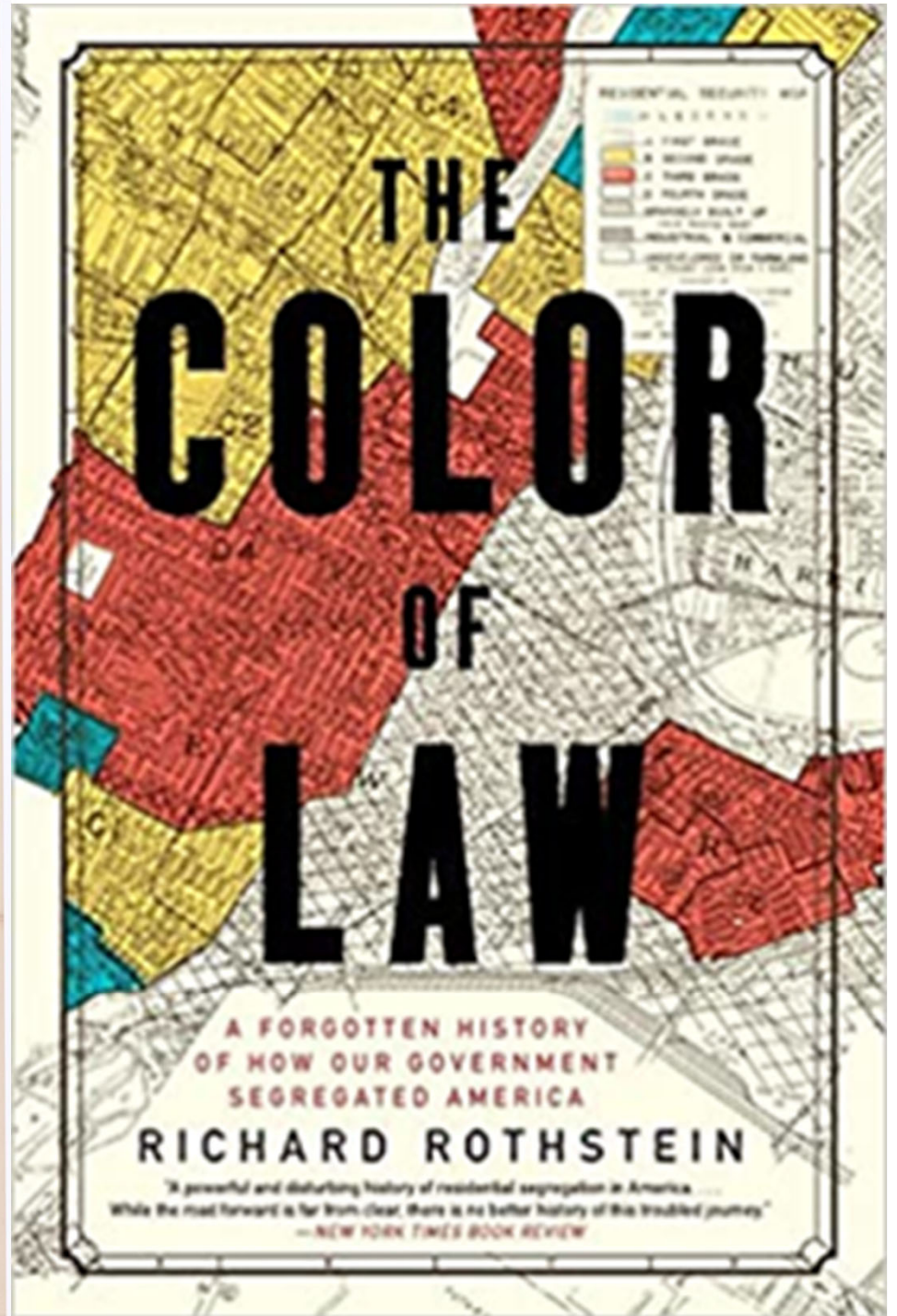
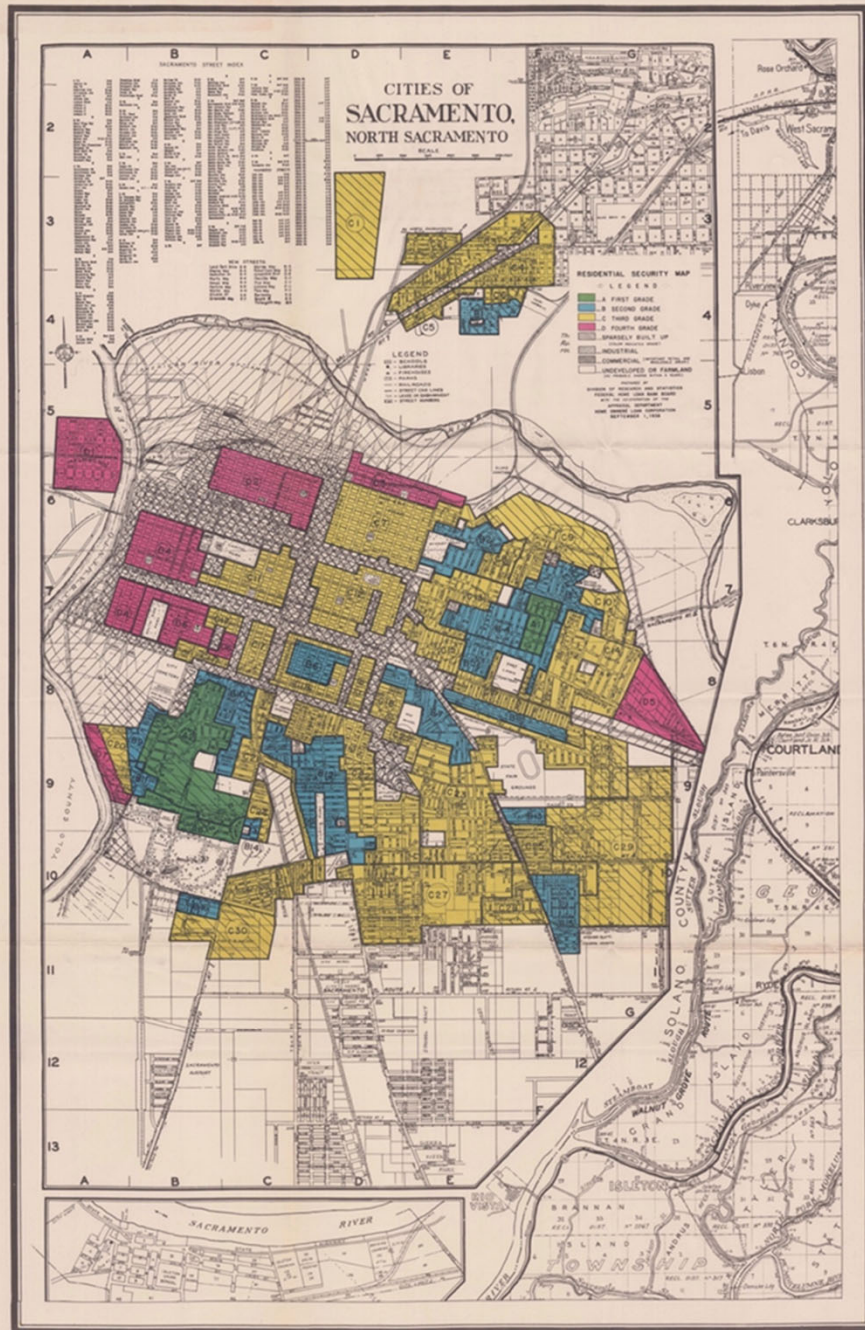
January 19, 2023

*Forthcoming in the *Journal of Urban Affairs*



Introduction

- Desired reduction in foreclosure rate following Great Depression
- Federal Homeowner's Loan Corporation (HOLC) created
 - Purchase select mortgages and reissue
 - Lower interest rate
 - Extended payment schedule
 - **Amortization of principle**
 - Devise and implement appraisal practices and maps for 249 metro areas
 - Nelson, et al. (2021) "Mapping Inequality," <https://dsl.richmond.edu/panorama/redlining>
 - Local real estate agents/bankers enlisted to formulate
 - Maps indicate "perceived risk"
 - D Grade (red) – riskiest
 - C Grade (yellow)
 - B Grade (blue)
 - A Grade (green) – safest
 - Overt **Institutional/Structural Racism**
 - Higher risk assigned for the then presence (or likely future) of non-white residents
 - Rothstein, R. (2018), *The Color of Law*



Source: "A BAY AREA Tourist for the Building Industry of California's Exclusionary Space," Richard Rothstein, David Galvin, Cities & Space, 2017, doi:10.1016/j.cities.2017.04.001. 4/20/2017, 10:14 AM

1. AREA CHARACTERISTICS:

a. Description of Terrain. Level with favorable grades - no construction hazards.

b. Favorable Influences. Convenience to transportation, trading areas, schools, churches, etc. Homogeneity of improvements and social and income levels. Adequate deed restrictions. Charm of location and high standard of construction and upkeep.

c. Detrimental Influences. High percent of land improvement leaves little margin for future growth. Limited market from J Street to Folsom owing to improvements being above popular price range. This does not apply north of J, as residences are more moderate in price.

d. Percentage of land improved 90%; e. Trend of desirability next 10-15 yrs. Up to static

2. INHABITANTS: Professional and business

a. Occupation executive type; b. Estimated annual family income \$ 3600 to 10,000 and up

c. Foreign-born families None%; Americans predominating; d. Negro 0%; Latino %

e. Infiltration of Good protected; f. Relief families None

g. Population is increasing Slowly; decreasing _____; static _____

3. BUILDINGS:

	PREDOMINATING	90 %	OTHER TYPE	%	OTHER TYPE	%
a. Type	6 to 7 rooms					
b. Construction	Frame, stucco & brick					
c. Average Age	12 Years					
d. Repair	Good (excellent)					
e. Occupancy	100 %					
f. Home ownership	87 %					
g. Constructed past yr. (1937)	3					
h. 1929 Price range	\$ 7500-20,000	100 %	\$	100 %	\$	100 %
i. 1935 Price range	\$ 6000-16,000	80 %	\$	%	\$	%
j. 1938 Price range	\$ 6750-18,000	90 %	\$	%	\$	%
k. Sales demand	\$ 6750-10,000 good		\$		\$	
l. Activity	Good					
m. 1929 Rent range	\$ 50-100	100 %	\$	100 %	\$	100 %
n. 1935 Rent range	\$ 40-80	80 %	\$	%	\$	%
o. 1938 Rent range	\$ 50-95	95 %	\$	%	\$	%
p. Rental demand	\$ 50-70 good		\$		\$	
q. Activity	Good					

4. AVAILABILITY OF MORTGAGE FUNDS: a. Home purchase Ample; b. Home building Ample

5. CLARIFYING REMARKS: Development in area began in 1924, and has shown steady growth since that time. In addition to having deed restrictions, it is zoned single-family residences. Is a high degree of homogeneity as to architectural types and standard of construction. Is the city's most popular district, that portion on 45th and 46th Sts. from J to 1/2 of a block north of Folsom Blvd. being particularly high grade. Although area has a 90% land improvement, it will remain "tops" for many years to come. Population density in area is very much below average for the city as a whole. Area is accorded a "high green" grade.

6. NAME AND LOCATION Part of East Sacramento-45th-47th SECURITY GRADE A AREA NO. 1
H to Folsom

1. AREA CHARACTERISTICS:

a. Description of Terrain. Level with favorable grade and no construction hazards.

b. Favorable Influences. Proximity to industrial employment and trading centers. Adequate transportation and grade schools. Walking distance to city center.

c. Detrimental Influences. Population density considerably higher than city average. Heterogeneous population. Age and obsolescence of residential structures. Western Pacific Railroad renders abutting residential properties practically unsaleable, except at a great discount.

d. Percentage of land improved 90%; e. Trend of desirability next 10-15 yrs. Downward

2. INHABITANTS: Common and semi-skilled

a. Occupation Laborers; b. Estimated annual family income \$ 1000-2400

c. Foreign-born families 50%; Latin races predominating; d. Negro For %

e. Infiltration of has occurred; f. Relief families Many

g. Population is increasing _____; decreasing _____; static Yes

3. BUILDINGS:

	PREDOMINATING	90 %	OTHER TYPE	%	OTHER TYPE	%
a. Type	5 - 6 room					
b. Construction	Frame					
c. Average Age	40 Years					
d. Repair	Fair					
e. Occupancy	97.5 %					
f. Home ownership	20 %					
g. Constructed past yr. <u>2</u>						
h. 1929 Price range	\$ 3000-3500	100 %	\$	100 %	\$	100 %
i. 1935 Price range	\$ 2250-2750	70 %	\$	%	\$	%
j. 1938 Price range	\$ 2400-3000	80 %	\$	%	\$	%
k. Sales demand	\$ Poor		\$		\$	
l. Activity	Slow					
m. 1929 Rent range	\$ 25 - 30	100 %	\$	100 %	\$	100 %
n. 1935 Rent range	\$ 17.50-22.50	70 %	\$	%	\$	%
o. 1938 Rent range	\$ 22.50-27.50	90 %	\$	%	\$	%
p. Rental demand	\$ All prices - good		\$		\$	
q. Activity	Good					

4. AVAILABILITY OF MORTGAGE FUNDS: a. Home purchase Limited; b. Home building Limited

5. CLARIFYING REMARKS: Old area is without deed restrictions, and while zoned general commercial & multi-family residential, the improvements are predominantly single-family, five and six room, frame dwellings of cheap to medium quality construction. These dwellings are, as a rule, quite old, but for a district of this kind have been well maintained. Population is very mixed. Italians predominate but with a sprinkling of Mexicans, Negroes, and Orientals. The subversive character of population constitutes the area's principal hazard. The area is accorded a "nodal red" grade.

6. NAME AND LOCATION Part of Old City SECURITY GRADE D AREA NO. 2

**Information from Written Evaluation Sheets Submitted by HOLC Evaluators in Support of Neighborhoods
Given Green (A – highest) or Red (D – lowest) Grades**

Grade/Neighborhood	Foreign Born Families	Black Families	Relief Families	Deed Protected	Relevant "Remarks" on "NS Form 8" (Area Description completed by HOLC Evaluators*)
A or Green (highest)					
A1 – East Sacramento	None	None	None	Yes	<i>In addition to having deed restrictions, it is zoned single-family residences. Is a high degree of homogeneity...</i>
A2 – Swanston Park & Land Park Terrace	None	None	None	Yes	<i>[H]omogeneity of social and income levels is fair to good.</i>
A3 – College Trac and Land Park Tract	None	None	None	Yes	<i>[H]as adequate deed restrictions and is zoned single-family residential.</i>
D or Red (lowest)					
D1 – Washington in Yolo County**	30%	None	Many	NA	<i>The particular hazard is "racial"; 30% of the population is foreign, including Orientals, Mexicans, and low-class Italians.</i>
D2 – Old City	50%	Few	Many	No	<i>[W]ithout deed restrictions... Italians predominate, but with a sprinkling of Mexicans, Negroes, and Orientals.</i>
D3 – Old City	Few	None	NA	Minimal	<i>Subversive races a definite hazard. An area without deed restrictions ... with the exception of the extreme eastern portion.</i>
D4 – Old City	75%	10%	Many	No	<i>[M]elting pot... [C]ontains the principal Japanese colony and the greatest concentration of Negroes in the city. [No] deed restrictions.</i>
D5 – (Unnamed)	None	None	Few	No	<i>[N]o deed restrictions, and zoning permits 2-family residences... [H]owever, improvements consist of ... old and obsolete [dwellings].</i>
D6 – Old City	30% – 40%	2%	Many	No	<i>Is the "bon ton" Oriental and Negro residential district in the city. Many diverse influences, from a mortgage standpoint...</i>
D7 – West End Bath Tract	50%	None	Few	NA	<i>Infiltration of Orientals, slowly occurring.</i>

*All information available at Nelson et al. (2021).

**House sales data from this HOLC area is not included in the analyses performed here because it is currently part of the City of West Sacramento. It is offered here as another example of the mindset of Sacramento-area HOLC evaluators who put together their ratings for Sacramento in 1938.

Introduction

- Sacramento maps published in 1938
- Racial-covenants prominent in Sac City home deeds
 - Absence of them offered as reason to downgrade rating
 - Implicitly enforced by real estate agents, not legally challenged till 1960s-70s
- Redlined neighborhood residents documented claims of mortgage inability, primary renters, declining neighborhood quality
- Sacramento post HOLC history
 - Redlined neighborhoods remained non-white, subject to teardown and urban renewal, little vintage residential left
 - Greenlined neighborhoods affluent and white in 1938 and remain so
 - Blue and some Yellowlined neighborhoods remain largely intact
 - Mixed commercial
 - Vintage homes
 - Walkable

Introduction

- HOLC maps as the **consequence** of previous structural racism and not the **cause** of continuing structural racism
 - This is **not as popularly understood**
 - HOLC lending during the 1930s not guided by their maps
 - In fact, evidence that disproportionately mortgaged to Black Americans and the poor
 - HOLC maps nationally archived after creation with little local access
- Federal Housing Authority (FHA) created their own redlined maps to guide where subsidized loan programs eligible
 - Evidence that widely used
 - Reason for BIPOC loss of intergenerational wealth
 - Why are the FHA maps not widely displayed and discussed?
 - FHA anticipated multiple late 1960s lawsuits rightfully claiming discrimination
 - Destroyed, all but one map for City of Chicago
 - Xu (2021) compared different FHA and HOLC redlining maps on aggregate housing outcome by Chicago Census Tract
 - Little (significant) explanatory power with HOLC (FHA) geographic designations

Introduction

- Racial differences in U.S. intergenerational wealth
 - Net worth of the average White-headed household (\$171,000) ten times greater than average Black-headed household (\$17,150) (McIntosh, Moss, & Nunn, 2020)
 - 70+ percent of white households owned their homes since the mid-1990s, while less than half of black households owned homes in early 2020 (Tanzi, 2020)
- HOLC's structurally racist practices tied anecdotally and with simple correlations to housing, wealth, and other outcomes decades later
 - Only a few regression-based studies of this relationship
 - **My research adds to these studies**

Literature Review

- **HOLC Redlining & Housing Outcomes**
 - Appel and Nickerson (2016) regression to determine avg home price at the Census tract level in surrounding buffer areas
 - In 1990 about 5% lower for neighborhoods with a worse HOLC rating relative to an adjacent area with a higher HOLC rating.
 - Krimmel (2021) difference-in-differences regression U.S. panel data
 - From 1970 to 2010, red relative to yellow Census Tracts experienced persistent reductions in housing supply and population density
- **HOLC Redlining & Other Neighborhood Outcomes**
 - Nardone et al. (2020 & 2021) lower HOLC grades more asthma visits and less current green space
 - Locke et al. (2021) formerly rated “D” (red) have about half the tree canopy coverage as areas that were formerly rated “A” (green)
 - Aaronson et al. (2021) growing up on “C” side of a “C” to “B” boundary, household income is 2.9 percentiles lower than growing up on the “B” side

Literature Review

• HOLC Redlining & Individual Outcomes

- McClure et al. (2019) controlling for age, gender, and educational attainment, residents in redlined areas more likely to rate their overall health negatively
- Krieger et al. (2020a & b) same controls as above, greater risk for pre-term birth or a late-stage diagnosis of cancers associated with living in a formerly redlined area
- Bennis et al. (2020) controlled for race and poverty, rate of gunshot victims living in a formerly redlined zone is five times greater
- Lukes and Cleveland (2021) historically redlined (D) neighborhoods receive less funding per student than those in A, B, and C rated and schools have lower standardized test scores
- ***Do these previously found negative outcomes in D & C neighborhoods relative to B & C show up in recent single home values?***
 - Unable to locate a hedonic regression study that tested
 - Started as a class project for a master's level applied regression course (PPA 207)

Regression Model

$$\text{Home Selling Price}_i = f(\text{Neighborhood Characteristics}_i, \text{Home Characteristics}_i, \text{Selling Characteristics}_i), \quad (1)$$

where,

$$\text{Neighborhood Characteristics}_i = f([\text{HOLC A Category Dummy}_i], \text{HOLC B Category Dummy}_i, \text{HOLC C Category Dummy}_i, \text{HOLC D Category Dummy}_i, [\text{Sacramento City SD Dummy}_i], \text{Natomas SD Dummy}_i, \text{San Juan SD Dummy}_i, \text{Twin Rivers SD Dummy}_i, \text{Folsom Cordova SD Dummy}_i, \text{Group of Relevant Zip Code Dummies}), \quad (2)$$

$$\text{Home Characteristics}_i = f(\text{Primary Home Square Footage}_i, \text{Secondary Home Square Footage}_i, \text{Years Old}_i, \text{Lot Square Footage Thousands}_i, \text{Bedrooms}_i, \text{Full Bathrooms}_i, \text{Half Bathrooms}_i, \text{Fireplace Number}_i, \text{Pool Dummy}_i, \text{Condominium Dummy}_i, \text{Halfplex Dummy}_i, \text{Raised Foundation Dummy}_i, \text{No Central AC Dummy}_i, \text{Roof Composite Dummy}_i, \text{CC\&R Dummy}_i, \text{HOA Dummy}_i, \text{HOA Dues}_i, \text{One Story Dummy}), \quad (3)$$

$$\text{Selling Characteristics}_i = f(\text{Days on the Market}_i, \text{August Sale Dummy}_i, \text{September Sale Dummy}_i, \text{October Sale Dummy}_i, \text{November Sale Dummy}_i, \text{December Sale Dummy}_i, \text{January Sale Dummy}_i, [\text{February Sale Dummy}_i]). \quad (4)$$

- “Rich” hedonic home price model
 - Constrained by available MLS data
 - Note Zip Code and School District (SD) controls

Data and Regression Analysis

- Data
 - 465 home sales
 - Between August 2019 and February 2020 (Pre Pandemic)
 - Homes only from within Sacramento City HOLC-classified neighborhoods through GIS mapping

<i>Variable Name</i>	<i>Mean HOLC A</i>	<i>Mean HOLC B</i>	<i>Mean HOLC C</i>	<i>Mean HOLC D</i>	<i>Mean HOLC A or B</i>	<i>Mean HOLC C or D</i>
<i>Dependent Variable</i>						
Selling Price	750,479	687,984	451,063	648,639	697,506	464,783

- Regression Analysis
 - Functional form: Log dependent – Linear explanatory
 - Robust regression coefficient standard errors clustered by zip code
 - Dummy variables representing home location in
 - A (greenlined), B (bluelined), C (yellowlined), or D (redlined)
 - AB or CD

Hedonic Regression Results (Log Home Selling Price Dependent Variable)

<i>Variable</i>	<i>All Homes Controlling for all HOLC Categories</i>	<i>All Homes Controlling for A/B and C/D HOLC Categories</i>
Neighborhood Characteristics		
HOLC B Category Dummy	-0.024	--
HOLC C Category Dummy	-0.151***	--
HOLC D Category Dummy [^]	-0.194***	--
HOLC C/D Category Dummy	--	-0.133***
San Juan SD Dummy	0.006	0.003
Twin Rivers SD Dummy ^{^^}	-0.111***	-0.112***
Zip Code 95811 Dummy	-0.034	-0.053
Zip Code 95814 Dummy	-0.225***	-0.255***
Zip Code 95815 Dummy	-0.750***	-0.748***
Zip Code 95816 Dummy	-0.082***	-0.083***
Zip Code 95817 Dummy	-0.427***	-0.426***
Zip Code 95818 Dummy	-0.160***	-0.161***
Zip Code 95820 Dummy	-0.604***	-0.603***
Zip Code 95821 Dummy	-0.374***	-0.372***
Zip Code 95822 Dummy	-0.370***	-0.370***
Zip Code 95833 Dummy ^{^^^}	-0.573***	-0.571***
--		
Home Characteristics		
Primary Home Sq Feet Thou	0.262***	0.261***
Second Home Sq Feet Thou	-0.0091	-0.0097
Years Old	-0.0003	-0.0003
Lot Square Feet Thou	0.012***	0.012***
Bedrooms	-0.033**	-0.032*
Full Bathrooms	0.093***	0.093***
Half Bathrooms	0.133***	0.132***
Fireplace Number	0.027	0.028
Pool Dummy	0.092***	0.093***
Halfplex Dummy	-0.347***	-0.341***
Condominium Dummy	0.021	0.023
Raised Foundation Dummy	0.042***	0.042***
No Central AC Dummy	-0.204***	-0.204***
Roof Composite Dummy	-0.088***	-0.090***
CC&R Present Dummy	-0.049***	-0.047***
HOA Present Dummy	-0.251***	-0.248***
HOA Dues	0.0004***	0.0004***
One Story Dummy	0.009	0.009
Selling Characteristics		
Days on the Market	-0.0005**	-0.0005**
August Sale Dummy	-0.046	-0.048
September Sale Dummy	-0.040	-0.042
October Sale Dummy	-0.058**	-0.059**
November Sale Dummy	-0.004	-0.006
December Sale Dummy	-0.047	-0.047
January Sale Dummy ^{^^^^}	-0.017	-0.020
Constant	13.10***	13.08***
Observations	465	465
R-Squared	0.856	0.856

Regression Results

- Compared to an A (greenlined) neighborhood, a similar home, controlling also for zip code and school-district amenities, sold for
 - 19.4% less if in a D (redlined) neighborhood
 - 15.1% less if in a C (yellowlined) neighborhood
 - No difference if in a B (bluelined) neighborhood
- Compared to an AB (green or bluelined) neighborhood, a similar home, controlling also for zip code and school-district amenities, sold for
 - 13.3% less if in a CD (yellow or redlined) neighborhood
- Also **Blinder-Oaxaca Decomposition**
 - Indicates portion
 - When both groups receive the same treatment but have different characteristics ("explained" component)
 - Occurs because one group is more favorably treated ("A/B") than the other ("C/D") given the same characteristics ("unexplained" component). Considered a measure of "discrimination" by labor economists.

Blinder-Oaxaca Decomposition

<i>Variable</i>	<i>Coefficient</i>	<i>Percentage of Difference</i>
Overall		
HOLC A/B Group	13.32***	
HOLC C/D Group	12.94***	
Difference	0.383***	
Explained	0.250***	65.3%
Unexplained	0.133***	34.7%

- Natural log 13.32 = \$611,360 (mean predicted A/B home value)
- Natural log 12.94 = \$416,779 (mean predicted C/D home value)
- Natural log 0.383 = \$194,582 (mean predicted difference A/B to C/D)
 - 2/3 of difference explained due to differences in house, zip, school differences
 - 1/3 due to “discrimination”
 - But could also be attributable to omitted explanatory variables

Conclusion

- 80+ years after HOLC's race-based neighborhood categorizations, we detect an influence of the structural racism captured by them in current home prices
- Recognize sanctioned structural racism as part of our history with measurable effects on home values disproportionately affecting generations of BIPOC Americans
 - Empirical evidence in support of [Big Ideas for Racial Equity](#)
 - 21st Century homestead act, baby bonds, education finance reform, ending the war on drugs, financial assistance to entrepreneurs of color, voting rights, free college, guaranteed jobs, workforce investment, and universal health coverage
 - [Reparative City Planning](#)
 - Curbing ability of local jurisdictions to keep affordable housing out through (de facto racism) laws, regulation, zoning, and practices meant to preserve the higher residential property values documented here due to past structural (de jure) racism
 - [Wassmer & Williams \(2021\)](#)