

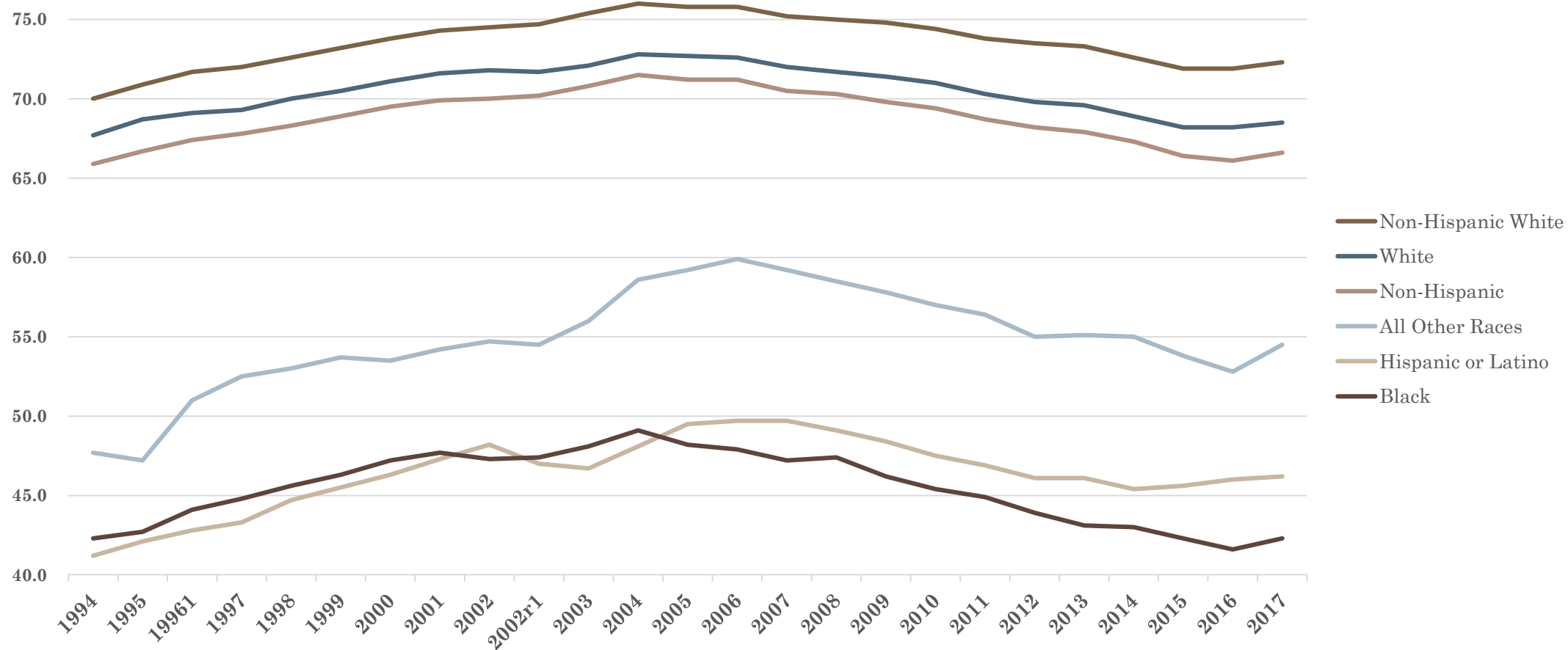
# An Unequal Dream

The Gap in Homeownership for White and Black Americans

By Michael Nicholson

# The Gap in Homeownership

# Homeownership by Race



# Data

# HDMA LAR Data

- Home Mortgage Disclosure Act
  - Enacted in 1975
  - Requires financial institutions to provide mortgage data to the public
- Loan Application Register
  - Loan level data released annually
  - Includes data on race, ethnicity, income, type (conventional loan, FHA loan, VA loan, etc.), amount, action taken, reason denied (if applicable), etc.
- Dodd-Frank
  - Beginning in 2018, the required characteristics in LAR data was expanded
  - These new data points include credit score, DTI, LTV, age, fees, interest rate and expanded information on commercial and business loans
    - Credit scores are stripped from publicly released versions of the data to protect the autonomy of the borrower

# Results

Regression models of rate spread on aggregated HMDA variables

Dependent variable: Rate Spread

Variables	Race	+ Borrower	+ Tract	+ County FE
	(1)	(2)	(3)	(4)
Majority Black	0.525*** (0.01)	0.212*** (0.01)	0.175*** (0.01)	0.118*** (0.01)
Income		-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
Loan amount (10,000s)		-0.008*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)
Female		0.227*** (0.01)	0.170*** (0.01)	0.139*** (0.01)
DTI		0.007*** (0.00)	0.008*** (0.00)	0.004*** (0.00)
LTV		0.012*** (0.00)	0.012*** (0.00)	0.009*** (0.00)
Origination charges (1,000s)		0.068*** (0.00)	0.072*** (0.00)	0.068*** (0.00)
Discount points (1,000s)		-0.035*** (0.00)	-0.037*** (0.00)	-0.027*** (0.00)
Conventional loan		-0.211*** (0.01)	-0.127*** (0.01)	-0.350*** (0.01)
Loan term (months)		-0.003*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
Manufactured		1.909*** (0.01)	1.696*** (0.01)	1.617*** (0.01)
Asian		0.092*** (0.01)	0.061*** (0.01)	-0.017 (0.01)
Native American		0.206*** (0.05)	0.204*** (0.05)	0.227*** (0.05)
Hispanic		0.387*** (0.01)	0.357*** (0.01)	0.343*** (0.01)
Pacific Islander		-0.563*** (0.08)	-0.531*** (0.08)	-0.162** (0.08)
Fannie Mae purchased			-0.389*** (0.02)	-0.390*** (0.02)
Freddie Mac purchased			-0.303*** (0.02)	-0.481*** (0.02)
Ginnie Mae purchased			-0.187*** (0.02)	-0.278*** (0.02)
Denied for credit			0.547*** (0.04)	0.115*** (0.03)
Tract to MSA median income			-0.004*** (0.00)	-0.002*** (0.00)
Lender market share			-0.058*** (0.01)	0.245*** (0.01)

- Before adjustment, predominately black neighborhoods face rate spreads that are 52.5 basis points higher than non-black neighborhoods
  - This equates to approximately \$950 a year in higher interest expense
- Borrower and tract characteristics account for ~70% of this gap
  - This holds for any order of adding these variables to the regression
- Geographic effects account for ~10%
- This leaves 11.8 basis points I predominately attribute to loan pricing discrimination
  - This corresponds to 14.3% higher rate spreads for black neighborhoods

# Regression models of rate spread on aggregated HMDA variables with fixed effects

Dependent variable: Rate Spread

Variables	County FE	Lender FE	Both FE	+ Interaction
	(4)	(5)	(6)	(7)
Majority Black	0.118*** (0.01)	0.157*** (0.01)	0.118*** (0.01)	0.111*** (0.01)
Income	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
Loan amount (10,000s)	-0.009*** (0.00)	-0.010*** (0.00)	-0.009*** (0.00)	-0.001*** (0.00)
Female	0.139*** (0.01)	0.144*** (0.01)	0.127*** (0.01)	0.112*** (0.01)
DTI	0.004*** (0.00)	0.006*** (0.00)	0.004*** (0.00)	0.003*** (0.00)
LTV	0.009*** (0.00)	0.011*** (0.00)	0.009*** (0.00)	0.007*** (0.00)
Origination charges (1,000s)	0.068*** (0.00)	0.065*** (0.00)	0.062*** (0.00)	0.060*** (0.00)
Discount points (1,000s)	-0.027*** (0.00)	-0.026*** (0.00)	-0.025*** (0.00)	-0.024*** (0.00)
Conventional loan	-0.350*** (0.01)	-0.210*** (0.01)	-0.345*** (0.01)	-0.393*** (0.01)
Loan term (months)	-0.002*** (0.00)	-0.002*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
Manufactured	1.617*** (0.01)	1.436*** (0.02)	1.403*** (0.02)	1.145*** (0.02)
Asian	-0.017 (0.01)	-0.001 (0.01)	-0.038*** (0.01)	-0.024** (0.01)
Native American	0.227*** (0.05)	0.274*** (0.04)	0.246*** (0.05)	0.148*** (0.05)
Hispanic	0.343*** (0.01)	0.402*** (0.01)	0.317*** (0.01)	0.299*** (0.01)
Pacific Islander	-0.162** (0.08)	-0.420*** (0.08)	-0.238*** (0.08)	-0.231*** (0.08)
Fannie Mae purchased	-0.390*** (0.02)	-0.402*** (0.02)	-0.363*** (0.02)	-0.352*** (0.02)
Freddie Mac purchased	-0.481*** (0.02)	-0.421*** (0.02)	-0.486*** (0.02)	-0.484*** (0.02)
Ginnie Mae purchased	-0.278*** (0.02)	-0.260*** (0.02)	-0.276*** (0.02)	-0.293*** (0.02)
Denied for credit	0.115*** (0.03)	0.403*** (0.04)	0.084** (0.03)	-0.010 (0.03)
Tract to MSA median income	-0.017*** (0.00)	-0.011*** (0.00)	-0.015*** (0.00)	-0.003*** (0.00)
Lender market share	0.245*** (0.01)	0.200*** (0.01)	0.268*** (0.01)	0.18 (0.36)

- Past literature has shown that black borrowers are much more likely to use high-cost lenders
  - This necessitates the use of lender fixed effects
- In contrast to past results, I find that county-level fixed effects largely encapsulate the lender fixed effects
  - This may result from the geographic effects capturing the geographic distribution of lenders
  - This is apparent in the identical Majority Black coefficient in specification 4 and 6
- Adding the interaction of lender fixed effects and their market share does have a small impact, but .7 basis points has little economic significance in practice



# Robustness

**Regression models of rate spread on aggregated HMDA variables with fixed effects**

Dependent variable: Rate Spread

Variables	All Terms	30 Year	Non-30 Year
	(4)	(7)	(8)
Majority Black	0.118*** (0.01)	0.109*** (0.01)	0.151*** (0.03)
Observations	68,139	67,792	30,143
R <sup>2</sup>	0.61	0.58	.51
Adjusted R <sup>2</sup>	0.59	0.55	.47

- To compare my results to past studies utilizing only 30-year-loans, I reran my models using only data from 30 and non-30 year loans
- Overall, the estimated loan pricing discrimination differential for 30 year loans and all loans is small
  - However, it does appear only considering 30-year loans slightly underestimates pricing discrimination
- More notably, the differential between solely 30 and non-30 year loans is much larger at ~4 basis points
- In of itself, this may not indicate greater rates of pricing discrimination in non-30 year loans since some features like adjusted-rate are not present in the model
  - This does, however, showcase yet another area for which black households face higher loan pricing
  - This is especially problematic if black borrowers are steered to these loan types

**Regression models of rate spread on aggregated HMDA variables with fixed effects**

Dependent variable: Rate Spread

Variables	Majority Black	Quarter Black	Proportion Black
	(4)	(9)	(10)
Majority Black	0.118*** (0.01)		
Quarter Black		0.080*** (0.00)	
Proportion Black			0.224*** (0.01)
Observations	68,139	68,139	68,139
R <sup>2</sup>	0.61	0.61	0.61
Adjusted R <sup>2</sup>	0.59	0.59	0.59

- The Majority Black variable is heavily skewed with only 5% of tracts meeting the threshold of having over 50% black applicants
- To check the robustness of using this as an explanatory variable, I reran the model using a binary variable for if over 25% of the applicants in a tract were black and a continuous black population variable
- The results of these models are in line with economic intuition, with the Quarter Black tracts showing a smaller but significant estimate of pricing discrimination and the continuous variable also showing a significant estimate for pricing discrimination
  - Note: the Proportion Black coefficient can be interpreted as a 2.24 increase in expected rate spreads for a 10 percentage point increase in black applicants

Variables	County FE	+ Census Variables
	(4)	(8)
Majority Black	0.118*** (0.01)	0.100*** (0.01)
Bachelor's Degree		-0.145*** (0.01)
Vacancy Rates		0.02 (0.01)
Unemployment		0.196*** (0.07)
Food Stamps		0.002*** (0.00)
Rentals		-0.097*** (0.01)
Uninsured		0.169*** (0.02)
Observations	68,139	67,332
R <sup>2</sup>	0.61	0.63
Adjusted R <sup>2</sup>	0.59	0.61

- Including the ACS variables decreases the estimation of pricing discrimination by 1.8 bps
  - This would suggest that omitting these tract-level variables introduces omitted variable bias to the model
- In comparison to non-predominantly black neighborhoods, black neighborhoods have:
  - Lower rates of bachelor's degree attainment (17.3% vs. 31.8%)
  - Higher rates of uninsured residents (31.8% vs. 13.1%)
  - Significantly higher rates of government subsidies (29.7% vs. 12.8%)
  - Higher unemployment rates (5.7% vs. 3.0%)
  - Higher vacancy rates (16.9% vs. 11.5%)

### Regression models of rate spread on aggregated HMDA variables with fixed effects

Dependent variable: Rate Spread

Variables	Majority White	Quarter White	Proportion White
	(13)	(14)	(15)
Majority White	-0.051*** (0.00)		
Quarter White		-0.096*** (0.01)	
Proportion White			-0.159*** (0.01)
Observations	68,139	68,139	68,139
R <sup>2</sup>	0.61	0.61	0.61
Adjusted R <sup>2</sup>	0.59	0.59	0.59

- The coefficients on these variables are negative, indicating that white tracts receive a rate discount in comparison to tracts with more significant minority populations
- This matches economic intuition that white borrowers receive preferential treatment compared to other races.
- These results suggest that the model is robust across different races and is in line with the results of previous literature

### Regression models of rate spread with median tract variables

Dependent variable: Rate Spread

Variables	Average Variables	Average with Census	Median Variables	Median with Census
	(4)	(8)	(16)	(17)
Majority Black	0.118*** (0.01)	0.100*** (0.01)	0.164*** (0.01)	0.135*** (0.01)
Observations	68,139	67,332	68,540	67,726
R <sup>2</sup>	0.61	0.63	0.55	0.58
Adjusted R <sup>2</sup>	0.59	0.61	0.53	0.56

- Estimated pricing discrimination using median values is approximately 3.5 basis points higher than when using average values
- This would indicate that there is skew in the distribution of applicants
  - A small number of higher-quality borrowers in predominately black tracts hold down average rate spreads in these communities
  - This is in contrast to my initial intuition that weaker borrowers may be pushing up rate spreads in predominantly black tracts
- These results suggest that pricing discrimination is even more pronounced for the median applicant than suggested by the baseline model
- It is not a small subset of weaker black borrowers in predominantly black tracts that face pricing discrimination but a majority of all borrowers in these tracts