



Bias and Fairness: Laying the Foundation for the Path Forward on Race and Insurance

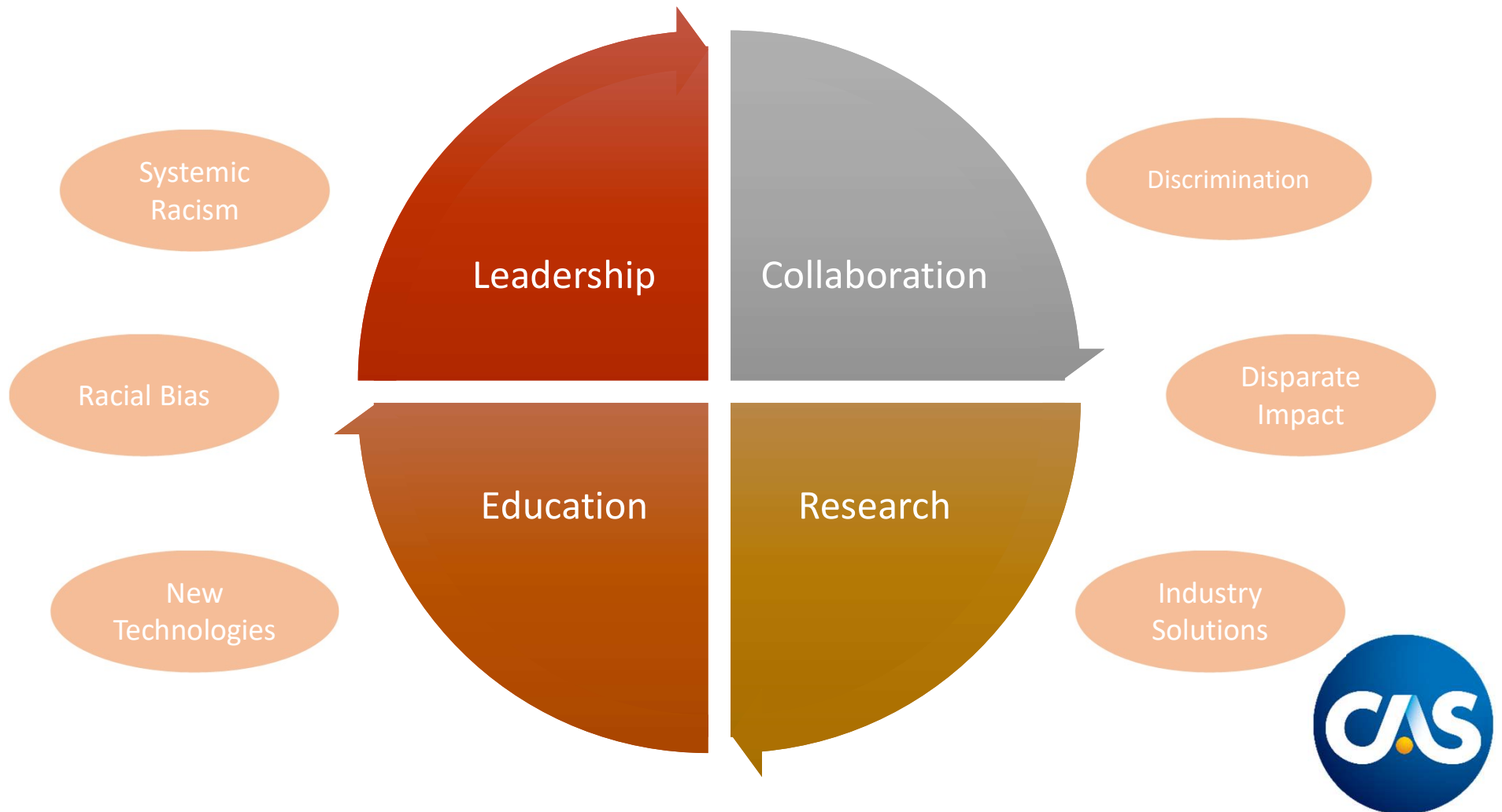
March 16, 2022

General Session 2

CAS RPM Seminar

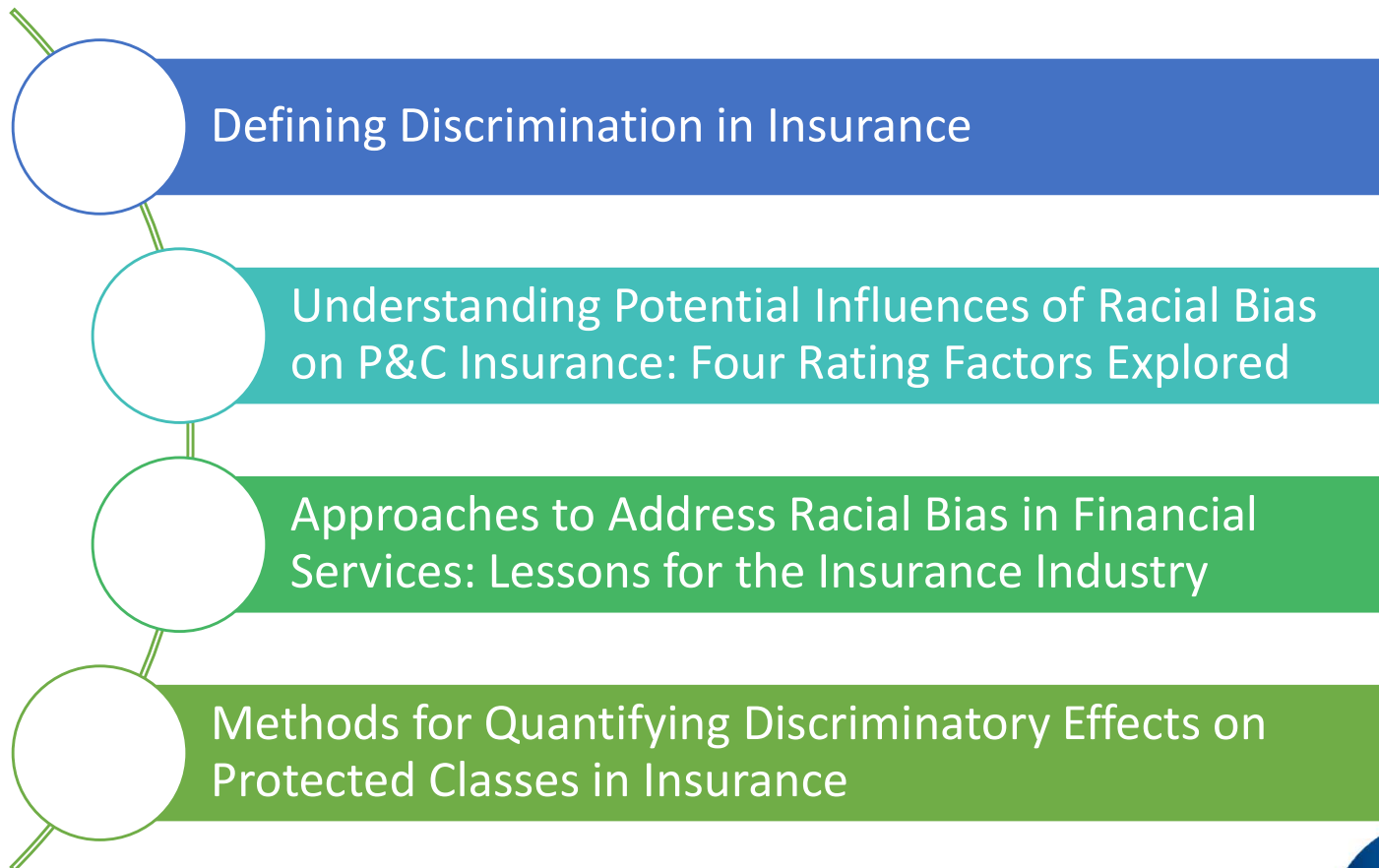


CAS Approach to Race and Insurance Pricing





Race and Insurance Pricing Research



Questions?

diversity@casact.org



Defining
Discrimination
In Insurance



Why This Matters

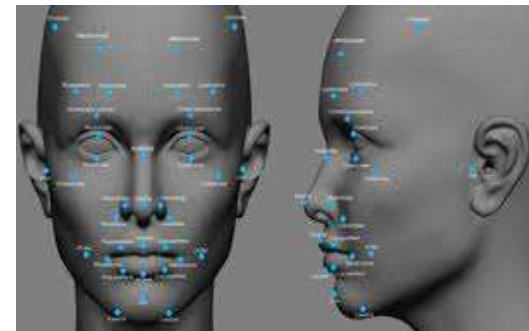
ATLANTA Black Star

Despite Good Driving Records, African-Americans Still Face Higher Insurance Premiums, Expert Blames Variables Used In Formula to Determine Rates

Jul 23, 2020, 04:53pm EDT

Insurance Regulators Pledge To Address Racism And Discrimination Within The Industry

Vs.



- Consistently Judgmental
- Hard to understand
- Auditable



Setting The Stage

01 Are You Sure You Know What **Protected Class** Is?

02 Revisiting **Unfair Discrimination**

03 The **Proxy Discrimination** Debate

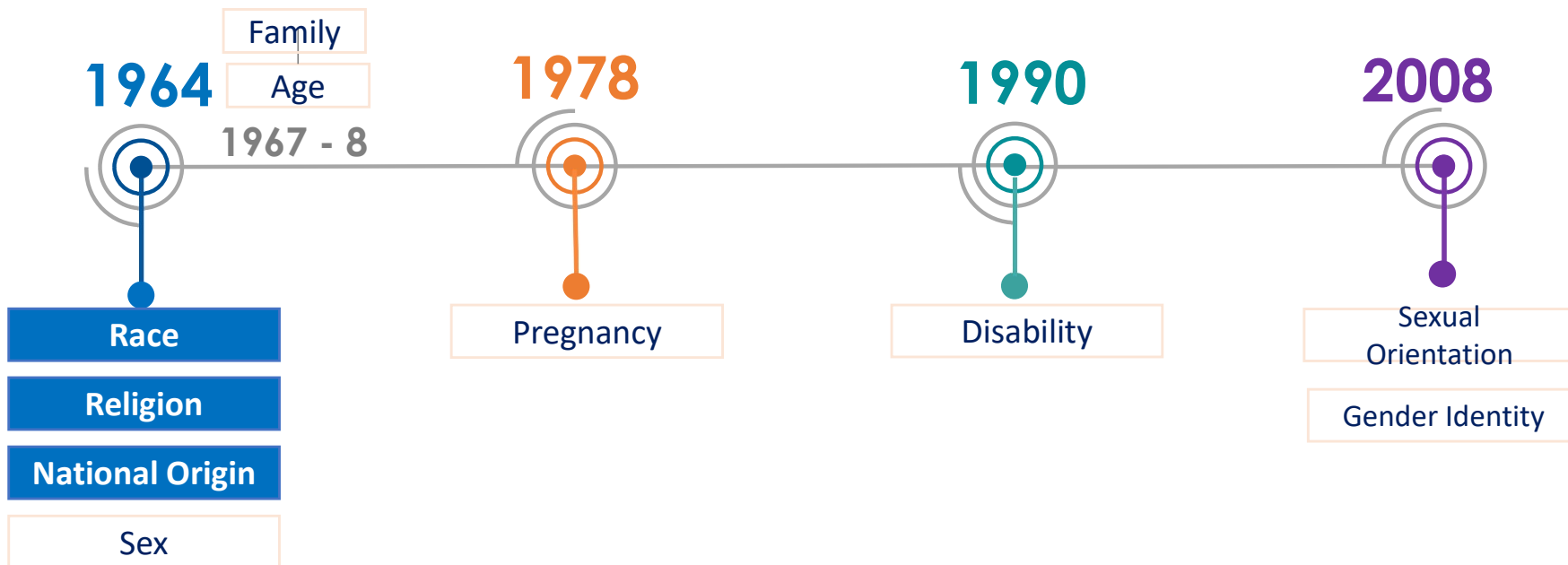
04 What Is **Disparate Impact** Anyway?



Protected Class

Protected Class

A protected class is a group of people who **share a common characteristic**, for whom federal and state laws have created protections that prohibit against discrimination because of that trait.



Revisiting Unfair Discrimination

Unfair Discrimination

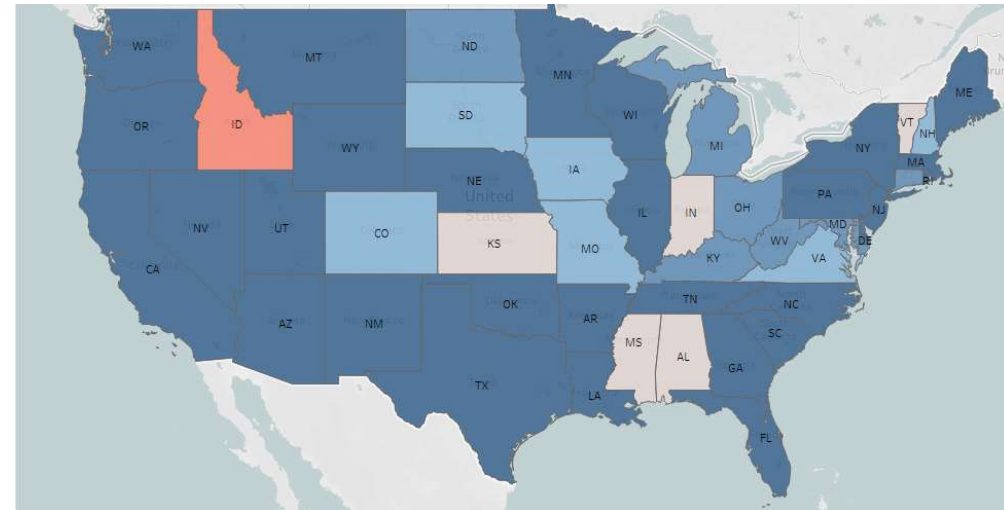


*rates must not be excessive, inadequate, or unfairly **discriminatory***¹

Established in McCarran Ferguson Act (1945)

- Discrimination ~ Differentiation
- No protected class mention
- Most states define protected class as part of unfair discrimination, but not all!

1. Race was prohibited for the purposes of accepting a risk








- Dark blue = restrict protected class in classification and rating
- Lighter colors → less restrictive of protect class in classification (or silent)

Unfair Discrimination does not directly govern discrimination against protected class



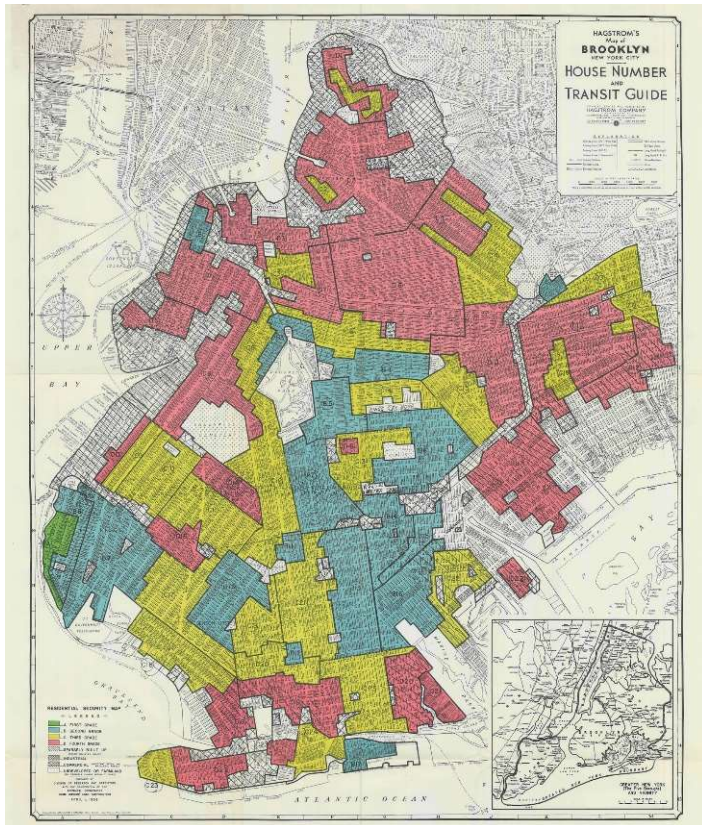
The Proxy Discrimination Debate

What Is Proxy Discrimination?

 <p>American Property Casualty Insurance Association INSURING AMERICA</p>	 <p>NCOIL</p>	 <p>FTC</p>	 <p>NAIC</p>	 <p>CENTER FOR ECONOMIC JUSTICE HOME CONTACT US</p>
<p>“Proxy theory” was adopted by the courts as an element of disparate treatment to recognize a policy should not be allowed to use a technically neutral classification as a proxy to evade Title VII’s prohibition</p>	<p>Proxy Discrimination means the intentional substitution of a neutral factor for a factor based on color, creed...for the purpose of discriminating against a consumer</p>	<p>Whether an included variable acts in whole or in part as a statistical proxy for excluded variables such as race, ethnicity and income</p>	<p>Principles on AI: “AI actors should...avoid proxy discrimination against protected classes. AI systems should...avoid harmful or unintended consequences”</p>	<p>Use of a non-prohibited factor that, due in whole or in part to a significant correlation with a prohibited class causes unnecessary, disproportionate outcomes</p>
<p>Intent Required</p>	<p>Intent Required</p>	<p>Unclear</p>	<p>Intent Not Required</p>	<p>Intent Not Required</p>
<p>Assert this is the legal definition</p>	<p>Assert this is a type of unfair discrimination</p>	<p>What counts as a statistical proxy?</p>	<p>How do insurers avoid unintended consequences?</p>	<p>How do you determine an outcome is unnecessary?</p>



An Example Of Proxy Discrimination



What Is Redlining?

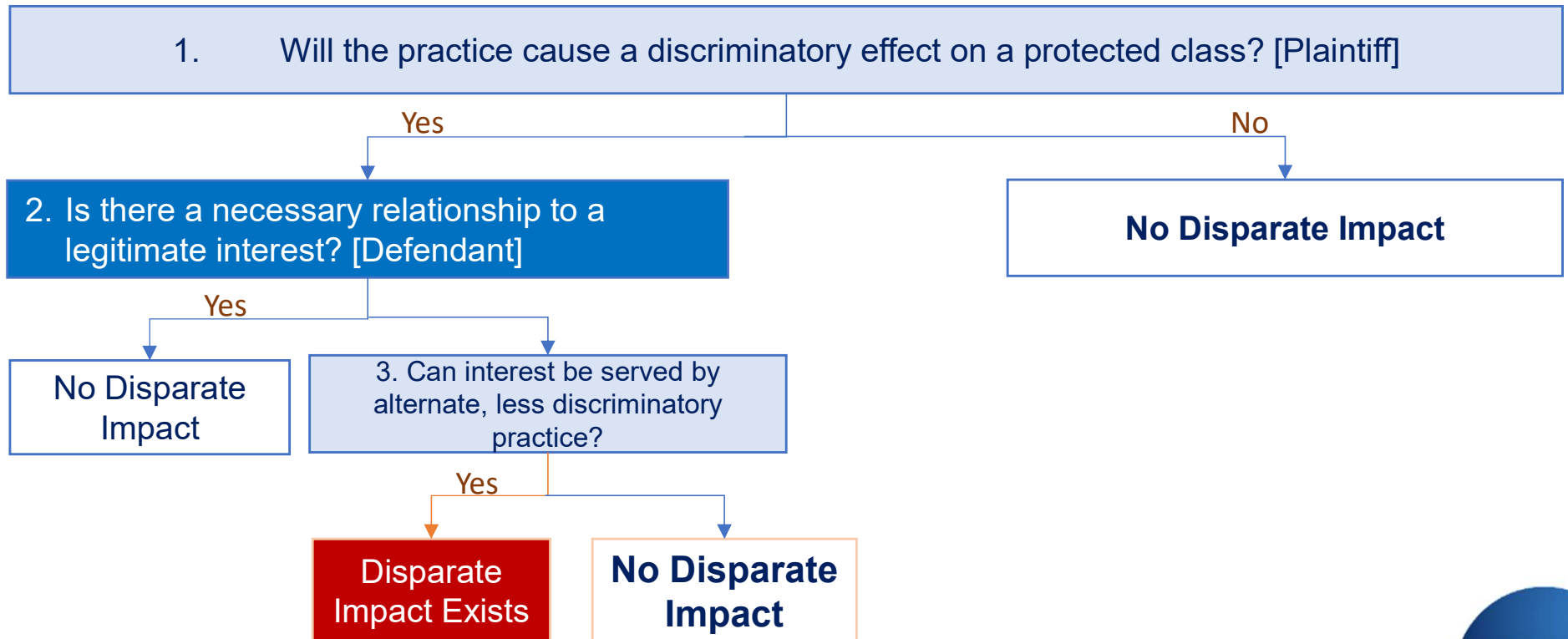
- Policy instituted in 1933 as part of the New Deal (created Federal Housing Authority, FHA)
- Determined eligibility for mortgage loans
- UW Manual identified rating characteristics on which to classify neighborhoods (Property, Location, Borrower)

Why Is It Proxy Discrimination?

- *No explicit use of race*
- *Used various “proxies” e.g. moral character, adverse infiltrations*
- *Effect: inability for African Americans to get loans*



Disparate Impact



Why Actuaries Should Care



*Regulators
determined what is
acceptable for rating*



*Actuaries
determine rates
based on regulatory
guidance*



*Confused
consumers*

*Regulators
contemplating new
regs*



*Actuaries informing
regulators on
implications of insurance
regulation*



*Better informed stakeholders
(regs and consumers)*





Understanding Potential Influences of Racial Bias on P&C Insurance: Four Rating Factors Explored

2021 CAS Race and Insurance Research Task Force

Presented by Sharon Mott, FCAS

March 16, 2022



Background

- ‘Risk-based’ pricing ensures that insurance premiums reflect the risk of loss
- Race or ethnicity is a protected class
- Increased scrutiny by legislators and regulators
- Racial bias is systematic and multi-dimensional



Audience Poll #1

Which common rating variables/factors do you think could be impacted by racial bias?

(Type in Your Response)





4 commonly used factors in personal lines



Motor Vehicle Record
(MVR)



Credit Based
Insurance Score
(CBIS)



Geographic location



Homeownership



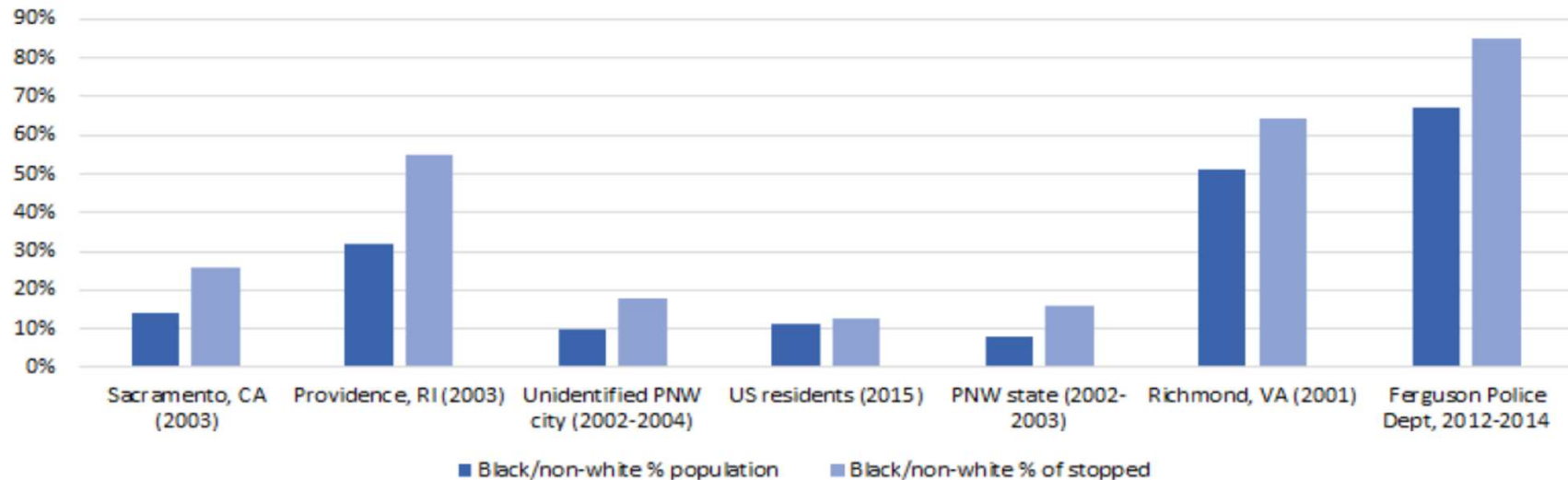


Motor Vehicle Record (MVR)



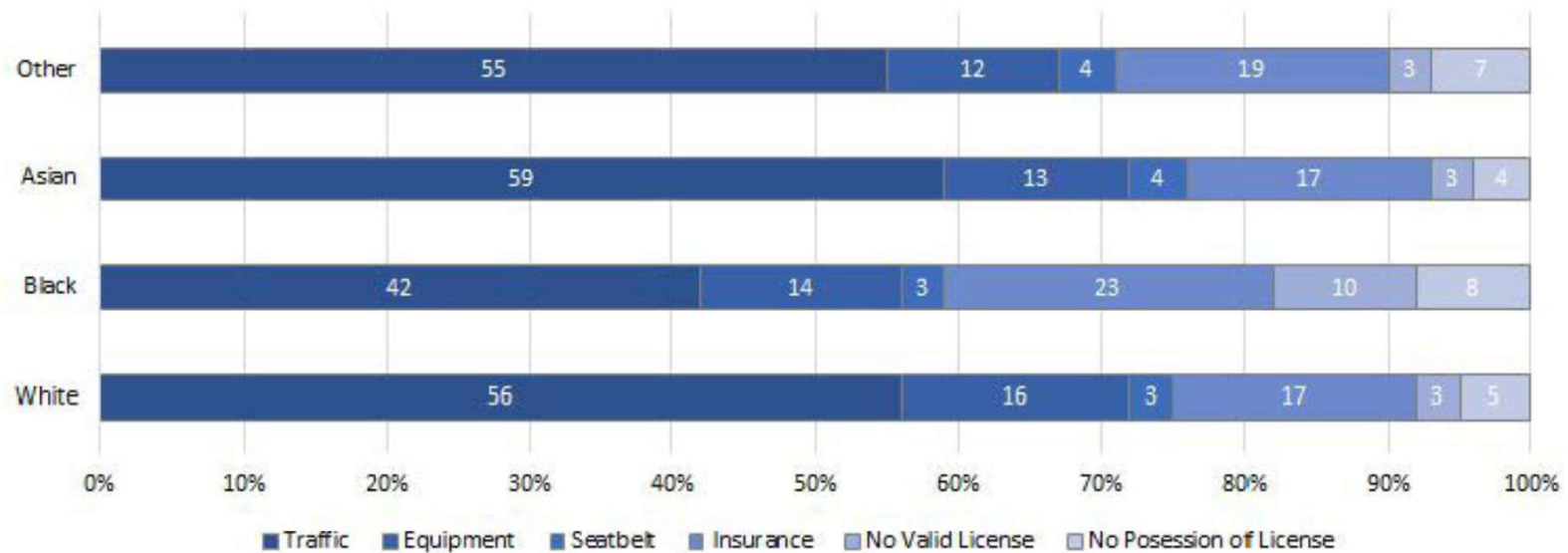
Several studies on traffic stops indicate that Black and other minority drivers are stopped at a disproportionately higher rate than White drivers.

Figure 8. Compilation of Studies Comparing Proportion of Black/Non-White Drivers in Population to Proportion of Traffic Stops





Black drivers were less likely than other groups to be cited for moving violations



Source: Greenleaf et al., 2011.





Credit-based Insurance Score (CBIS)



Credit score –vs- CBIS

Credit score and CBIS models use the same underlying information with respect to credit behaviors:

Derogatory negative indications on credit reports that generally mean a loan wasn't paid back as agreed.

Shopping inquiries into a credit report (e.g., when shopping for car loan and applying for credit).

Utilization how much available credit one uses at any given time (i.e., total balances to total credit limits)

History components of a credit report such as number of payments on time or late, number of credit cards and loans, how long credit accounts have been open.

Fair Credit Reporting Act (FCRA) and Equal Credit Opportunity Act (ECOA)

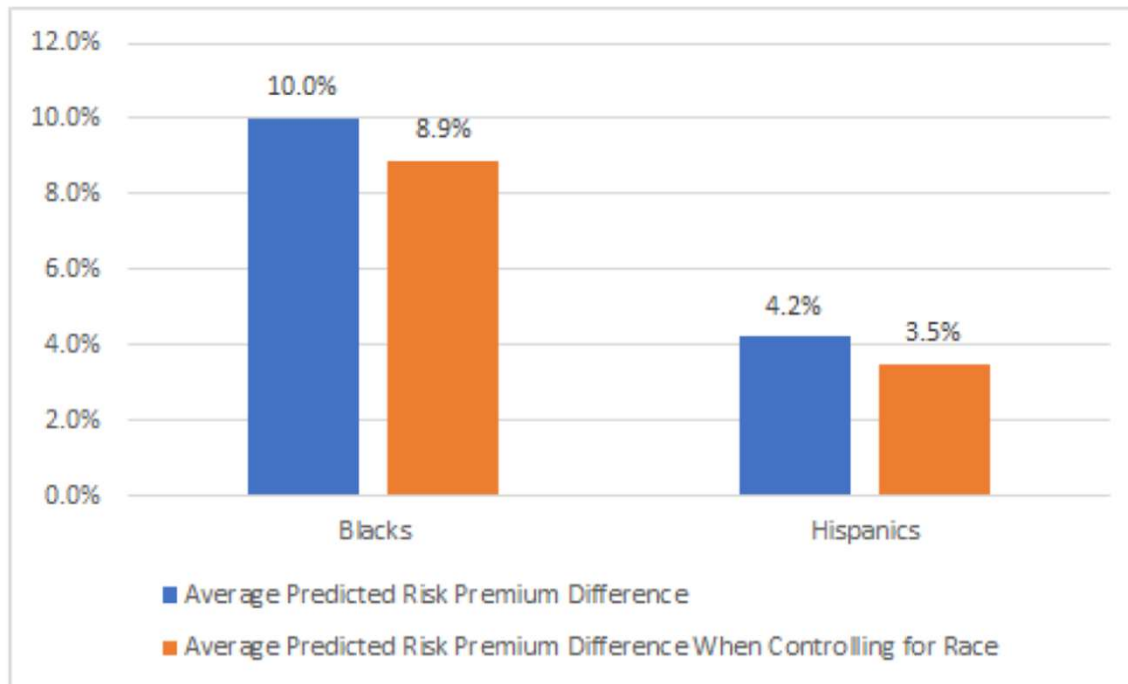
- enacted to protect against credit discrimination





CBIS results in increased premium for minority groups, but not itself a strong proxy for race/ethnicity

Figure 1. FTC Study – Average Increase in Predicted Risk Premium Arising from Use of Credit-Based Insurance Scores in Insurance Risk Modeling





Factors contributing to the continued decline/gap in the **financial well-being** of Black and Hispanic consumers

- Access to lending
- Disproportionate approach to debt collection
- Flaws and inaccuracies in credit report
- No credit history

Process tends to put more weight on past financial distress than current situation



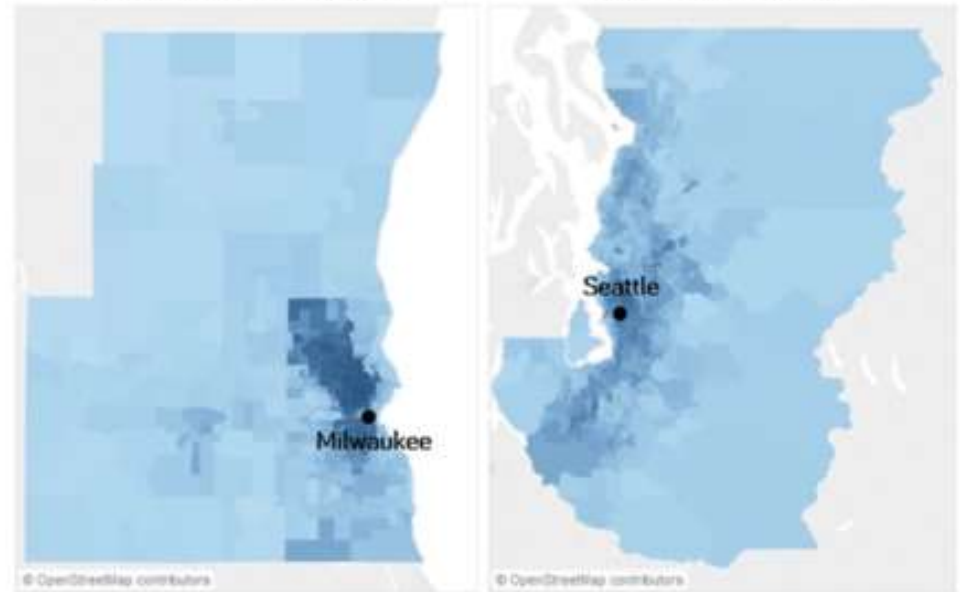


Geographic Location

Residential segregation exists everywhere, but varies in severity

Milwaukee: #1 most segregated

Seattle: #2 least segregated



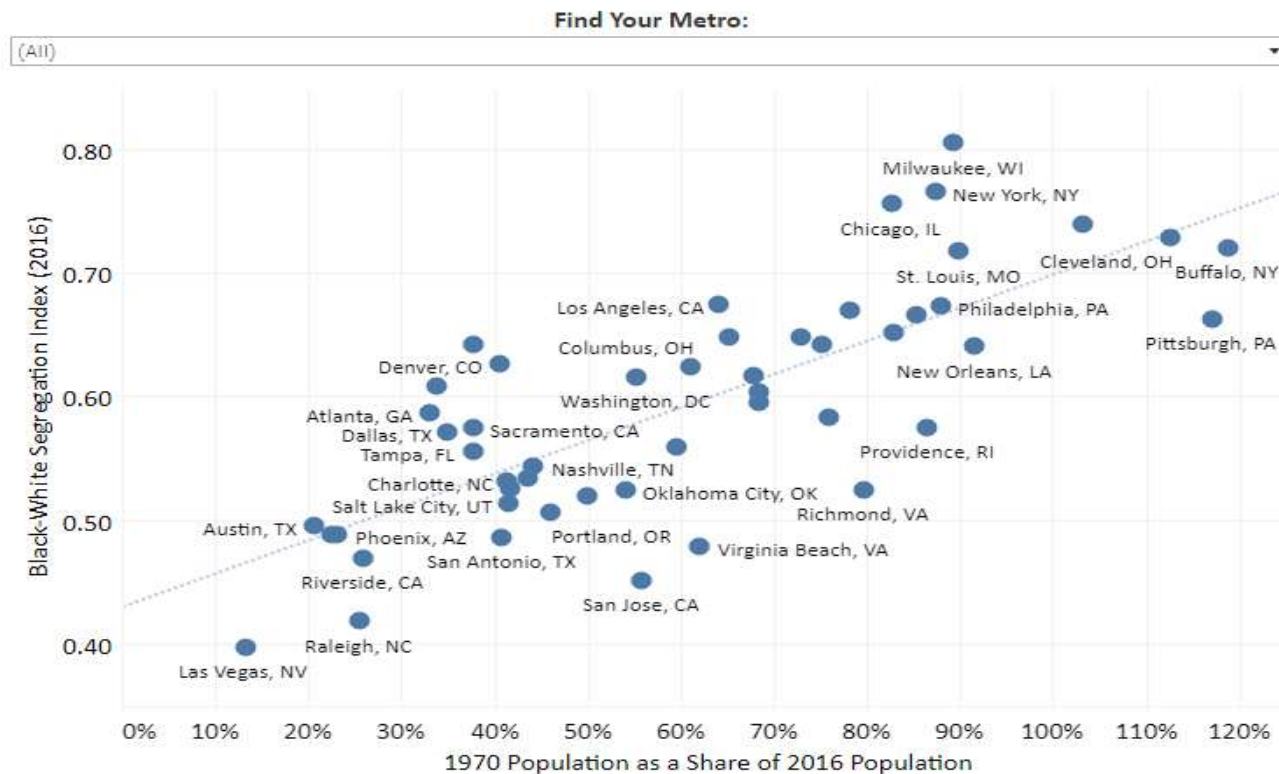
Source: Census ACS 5-year estimates, Apartment List calculations.
Note: Overall segregation indexes are 0.61 for Milwaukee and 0.32 for Seattle.

apartment  list



Segregation post-Fair Housing Act

Residential segregation highest in metros that were most established in 1970
2016 black segregation index vs. 1970 population / 2016 population: 50 largest metros



Source: Census ACS 5-year estimates; Decennial Census; Apartment List calculations.





Geographic Location as a Rating Factor

Concentration of Homes:

- Older Homes
- Urban Areas

Definition of Rating Territory Boundaries



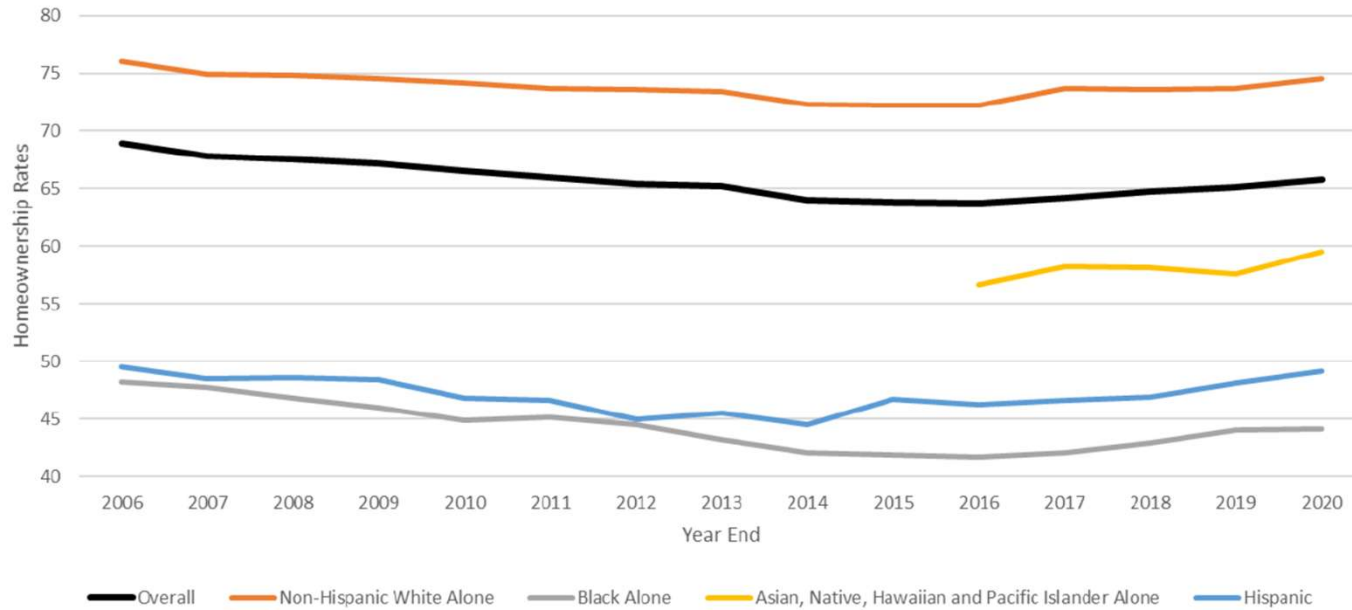


Homeownership



Wide gap in Homeownership remains

Figure 7. Homeownership Rates by Race and Ethnicity of Householder: 2006-Present



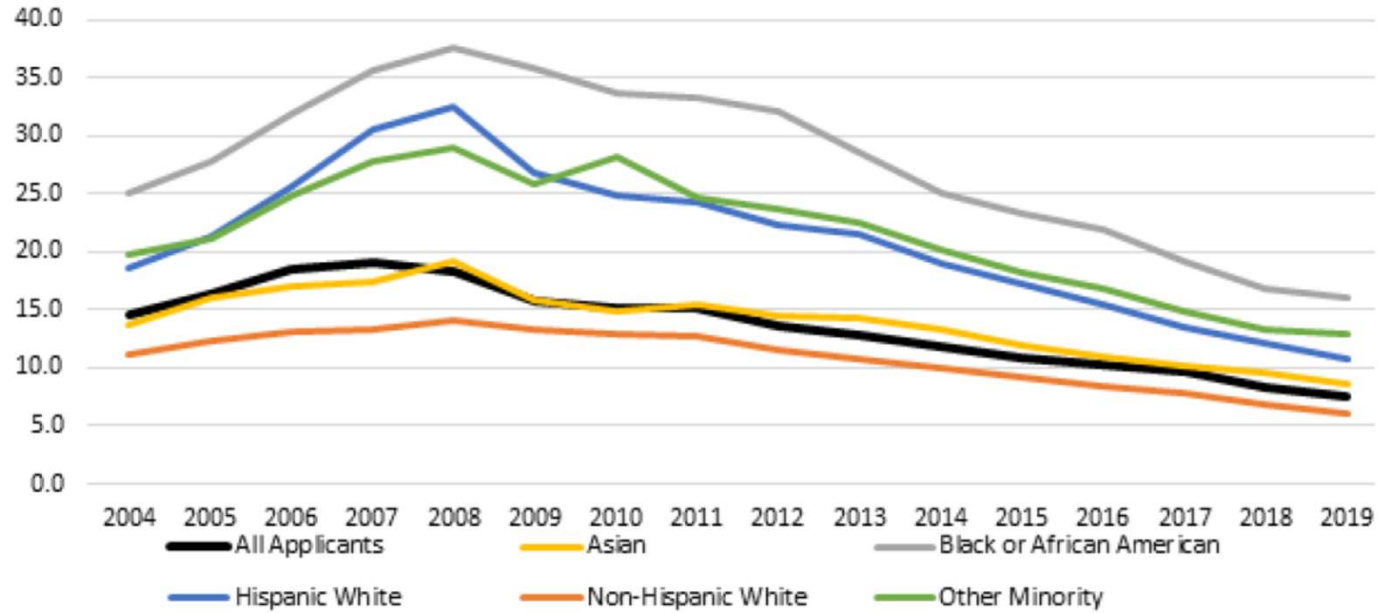
Source: United States Census Bureau. April 2021.





Despite reform attempts racial discrimination in lending remains a significant issue today

Figure 6. Home Purchase and Refinance Loan Denial Rates for Conventional Loans from 2004-2019.



Source: Consumer Financial Protection Bureau. June 2020.



Closing Comments



Actuarial approach reflects risk of loss



This research is not comprehensive or prescriptive



More data and analyses are needed to understand impact





Approaches to Address Racial Bias in Financial Services: Lessons for the Insurance Industry

Presented by Robin Harbage, FCAS
March 16, 2022



Financial Services

1. Mortgage Lending
2. Personal Lending
3. Commercial Lending
4. Credit Scoring



Mortgage Lending



Audience Poll #3

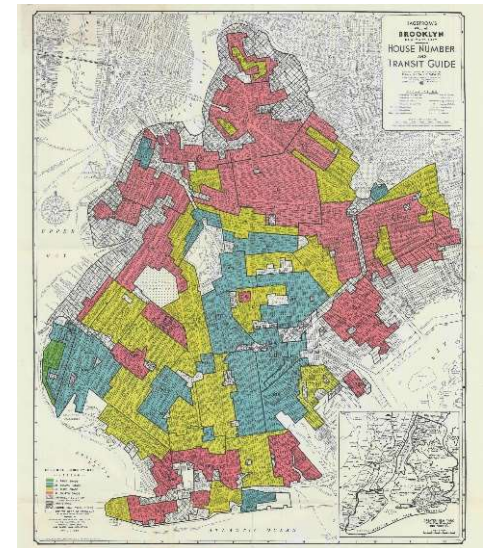
What was the Black and White Homeownership Gap in 1960?

- A. 10%
- B. 20%
- C. 30%
- D. 40%



Contributing Policies and Practices

- 1934 Federal Housing Act (New Deal)
- Valuation maps color-coded areas
 - **“Red”** >> As little as 10% minority owned
- Allowed covenants on titles prohibiting sales to Blacks
- 1934-1962 –Underwrote \$120B in new housing
 - < **2%** to non-White groups
- Penalties on “Predatory Loans”





Government intervention

Fair Housing Act (FHA) - 1968

Home Mortgage Disclosure Act - 1975

Community Reinvestment Act – 1977

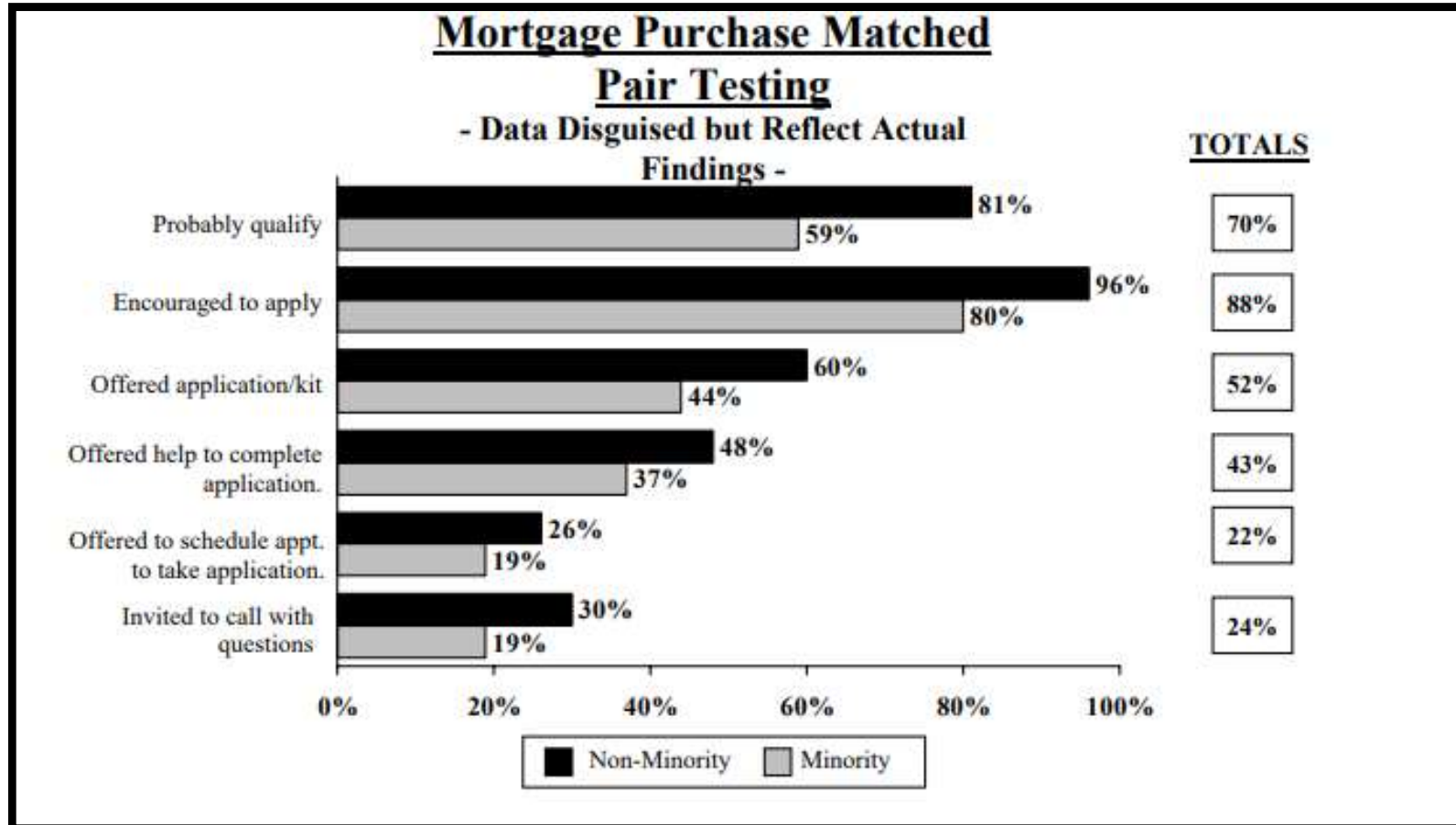
National Community Reinvestment Coalition – 1991

Housing Finance Agency (HFA) - 2008





Ongoing Bias Testing – Matched Pairs



Personal Lending





Personal lending issues



Face-to-Face
Lending

Access to
Banking

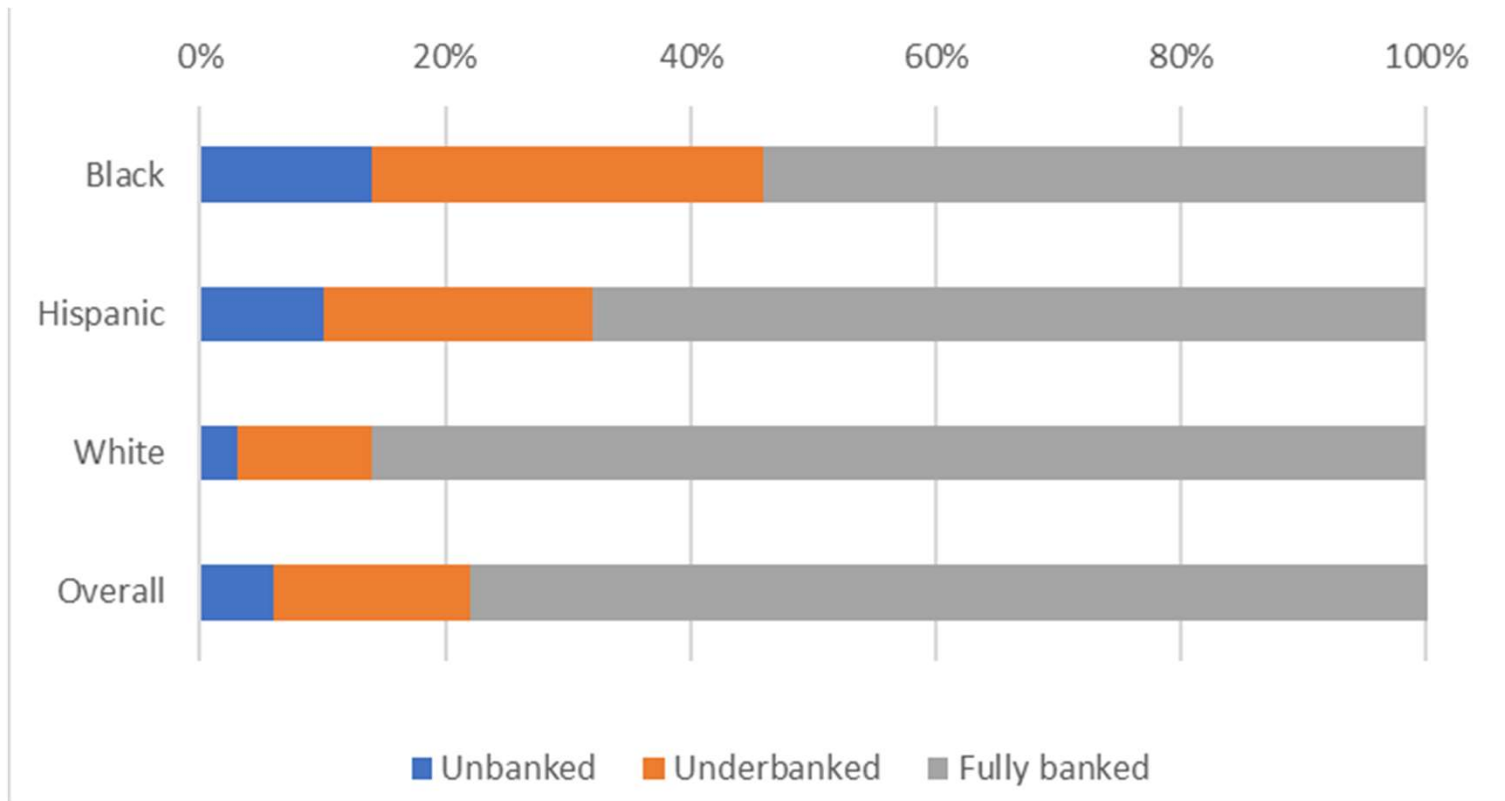


Unbanked &
Underbanked
Lack of Credit
history





Banking Status by Race/Ethnicity



Personal lending solutions

- Application of Community Reinvestment Act
- Implement low-cost banking services via USPS
- Community Development Financial Institutions (CDFI)
- Fintech products

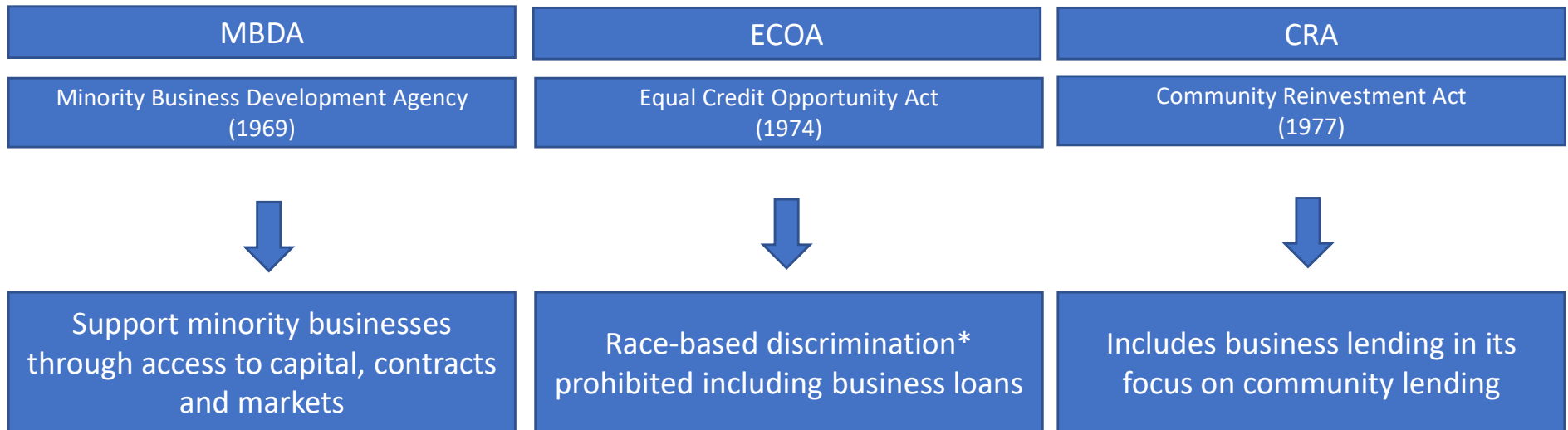


Commercial Lending





Government Intervention to Mitigate Discriminatory Impacts



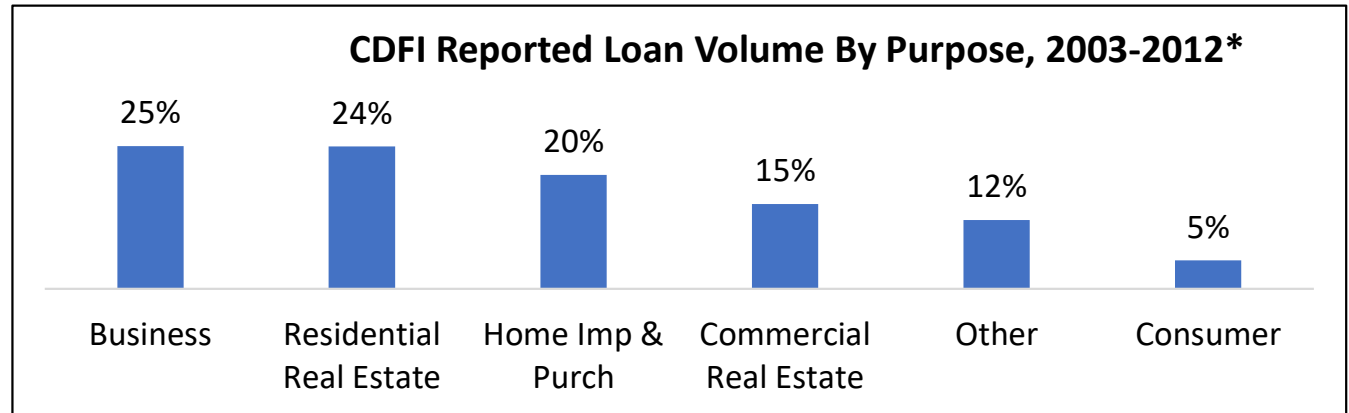
*Race, color, religion, national origin, sex, marital status or age discrimination unlawful



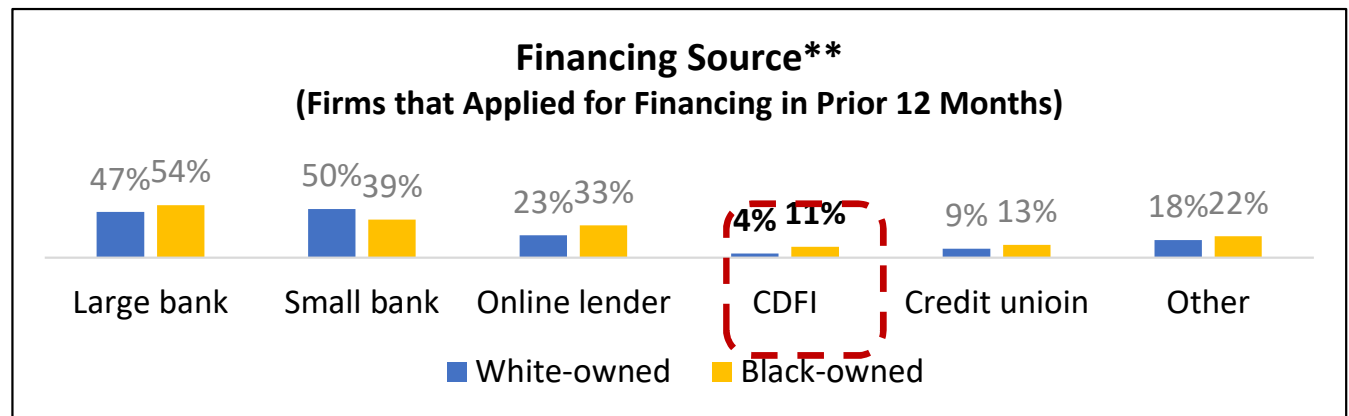


Community Development Financial Institutions

A significant portion of CDFI lending is focused on businesses...



Yet, CDFI commercial lending reach to Black businesses is still limited.



*CDFI Fund Transaction Level Report data

**2017 Small Business Credit Survey, Federal Reserve



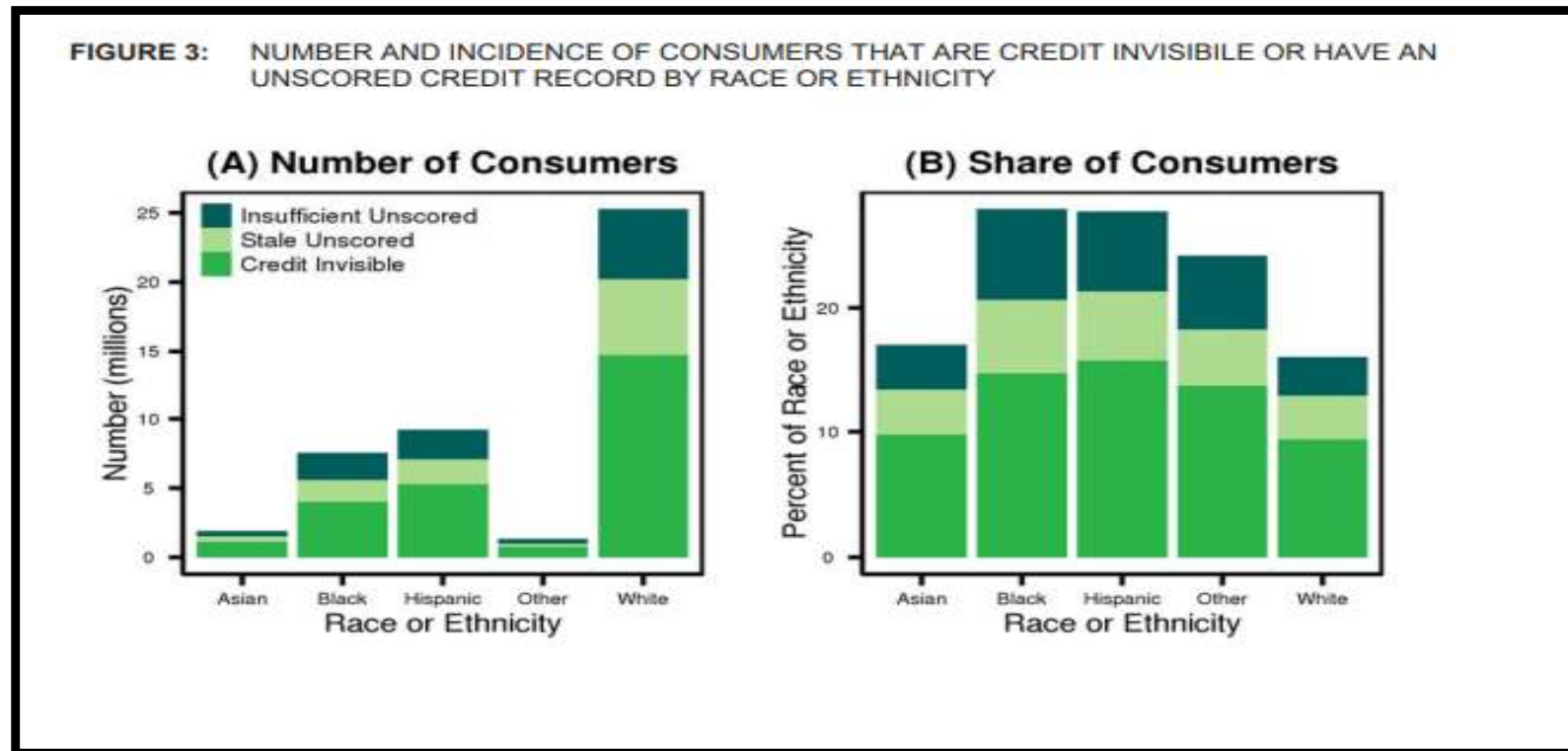
Credit Scoring





Lack of or Limited Credit History

CFCB research found that Black and Hispanic populations have higher rate of no credit / unscored records.





Alternative Data for Credit Scoring

Data Elements that may mitigate racial bias

- Rent
- Utility bills
- Phone bills
- Deposit account history
- Community group affiliation
- Netflix payments

Brookings Institution:

- Utility payments → increased acceptance rates
- New products using such data
 - Experian
 - Trans Union
 - Equifax



Conclusion

- Focus on outcome, not intent
- Solutions can be a combination of public and private actions
- Bias testing useful tool to measure disparate impact





Methods for Quantifying Discriminatory Effects on Protected Classes in Insurance

Roosevelt Mosley

CAS RPM Seminar

March 16, 2022

Roosevelt C. Mosley, Jr., FCAS, MAAA, CSPA

Principal & Consulting Actuary

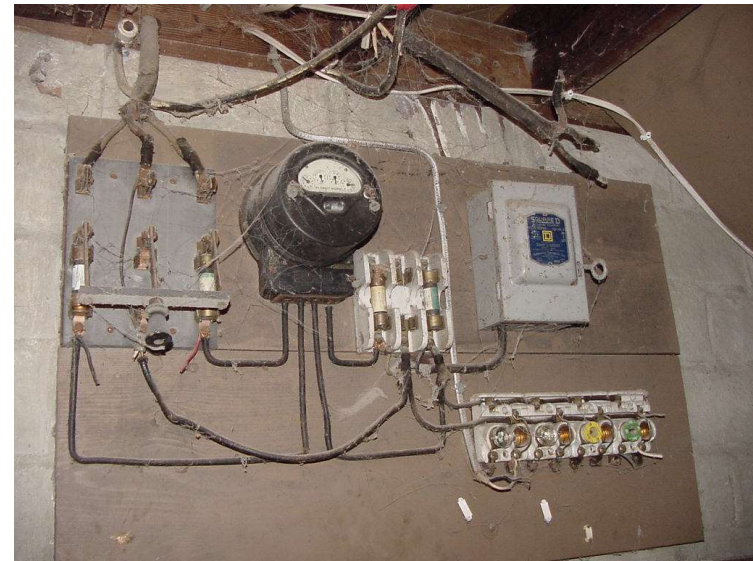
Methods for Quantifying Discriminatory Effects

- ▶ Background
- ▶ Accusations of Bias in Insurance
- ▶ What is Unfairly Discriminatory?
- ▶ Approaches for Measurement and Mitigation

Background



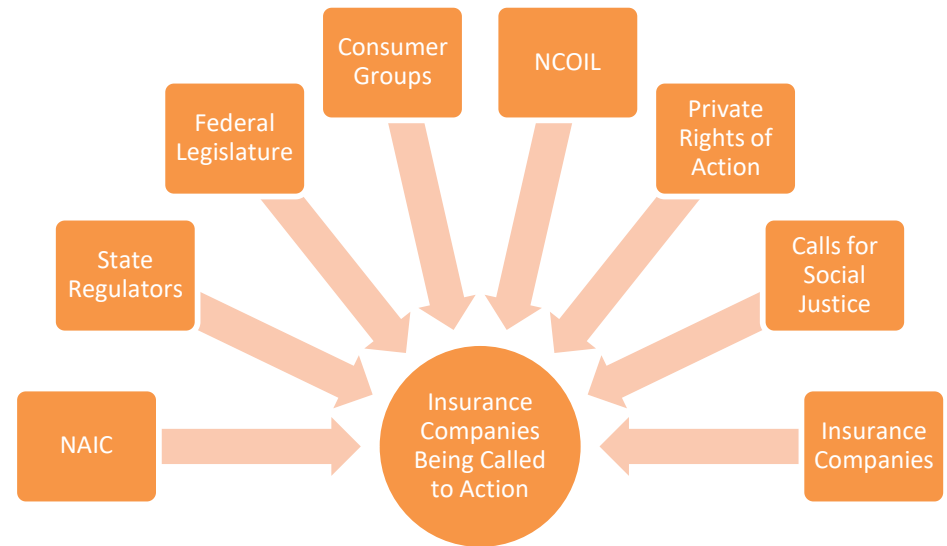
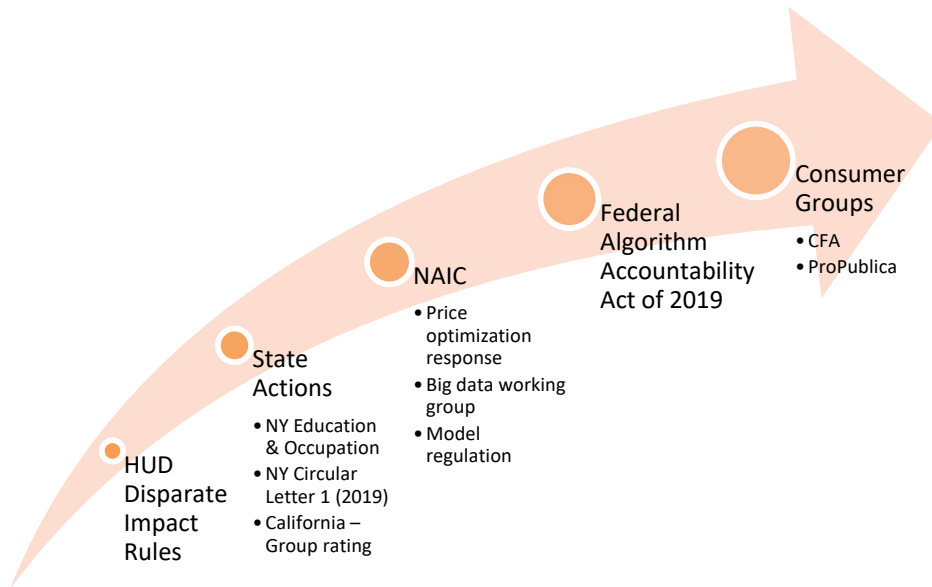
Potential Persisting Impacts of Redlining - Examples



Accusations of Bias in Insurance



Rising Tide...Mounting Pressure



What is “Unfairly Discriminatory”?



Ratemaking Guidance

- **State Rating Laws** – rates are to be not inadequate, not excessive and not **unfairly discriminatory**
- **Statement of Principles Regarding Property and Casualty Insurance Ratemaking** – A rate is reasonable and not excessive, inadequate or unfairly discriminatory if it is an **actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer**
- **Actuarial Standard of Practice No. 53** – “Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Retention”
- **Actuarial Standard of Practice No. 12** – “Risk Classification”
 - *Rates within a risk classification system would be considered equitable if differences in rates reflect material differences in expected cost for risk characteristics. In the context of rates, the word fair is often used in place of the word equitable (3.2.1)*
 - *While the actuary should select risk characteristics that are related to expected outcomes, it is not necessary for the actuary to establish a cause and effect relationship between the risk characteristic and expected outcome in order to use a specific risk characteristic (3.2.2)*

Discriminatory Effects – Key Question

Ultimately, the question of discriminatory effects on protected classes comes down to, at least in part, whether individual factors or combinations of factors derive their predictive power in full or in part from their correlation with a prohibited characteristic.

If so, then it must also be determined whether this results in disproportionately higher or lower rates for certain groups within that protected characteristic.

Approaches for Measurement and Mitigation



Current State of Affairs

**WATCH
THIS
SPACE!**



There is no concrete solution yet proposed and uniformly accepted

Research into best practices is still ongoing

Most research has focused on binary targets

Classification of Fairness Metrics

Demographic
Parity

Equalized Odds

Calibration

Predictive Equality

Independence	Separation	Sufficiency
$\hat{Y} \perp A$	$\hat{Y} \perp A Y$	$Y \perp A \hat{Y}$

Statistical Parity

Group Fairness

A - protected attribute

Y - observed value of target variable

\hat{Y} - predicted value of target variable

Predictive Parity

Balance Positive Class

Conditional Statistical Parity

Equal Opportunity

<https://fairmlbook.org>

Independence

The predictions and the protected attribute are statistically independent

$$\bar{Y} \perp A$$

$$\bar{P}(\text{claim occ}|\text{Male}) = \bar{P}(\text{claim occ}|\text{Female})$$

$$\bar{P}(\text{claim occ}|\text{Male}) = 10\% \text{ and } \bar{P}(\text{claim occ}|\text{Female}) = 10\% \text{ FAIR}$$

$$\bar{P}(\text{claim occ}|\text{Male}) = 10\% \text{ but } \bar{P}(\text{claim occ}|\text{Female}) = 20\% \text{ UNFAIR}$$

<https://fairmlbook.org>

Separation

The predictions and the protected attribute are statistically independent, conditional on the actual response

$$\bar{Y} \perp A | Y$$

$$\bar{P}(\text{claim occ} | \text{Male} \cap \text{claim} = \text{yes}) = \bar{P}(\text{claim occ} | \text{Female} \cap \text{claim} = \text{yes})$$

$$\bar{P}(\text{claim occ} | \text{Male} \cap \text{claim} = \text{yes}) = 10\% \text{ and } \bar{P}(\text{claim occ} | \text{Female} \cap \text{claim} = \text{yes}) = 10\% \text{ FAIR}$$

$$\bar{P}(\text{claim occ} | \text{Male} \cap \text{claim} = \text{yes}) = 10\% \text{ but } \bar{P}(\text{claim occ} | \text{Female} \cap \text{claim} = \text{yes}) = 20\% \text{ UNFAIR}$$

<https://fairmlbook.org>

Sufficiency

The actual response and the protected attribute are statistically independent, conditional on the predicted response

$$Y \perp A | \bar{Y}$$

$$P(Y = 1 | Male \cap \bar{P} = p) = P(Y = 1 | Female \cap \bar{P} = p) = p$$

$$P(Y = 1 | Male \cap \bar{P} = 10\%) = 10\% \text{ and } P(Y = 1 | Female \cap \bar{P} = 10\%) = 10\% \text{ FAIR}$$

$$P(Y = 1 | Male \cap \bar{P} = 10\%) = 10\% \text{ but } P(Y = 1 | Female \cap \bar{P} = 10\%) = 2\% \text{ UNFAIR}$$

<https://fairmlbook.org>

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