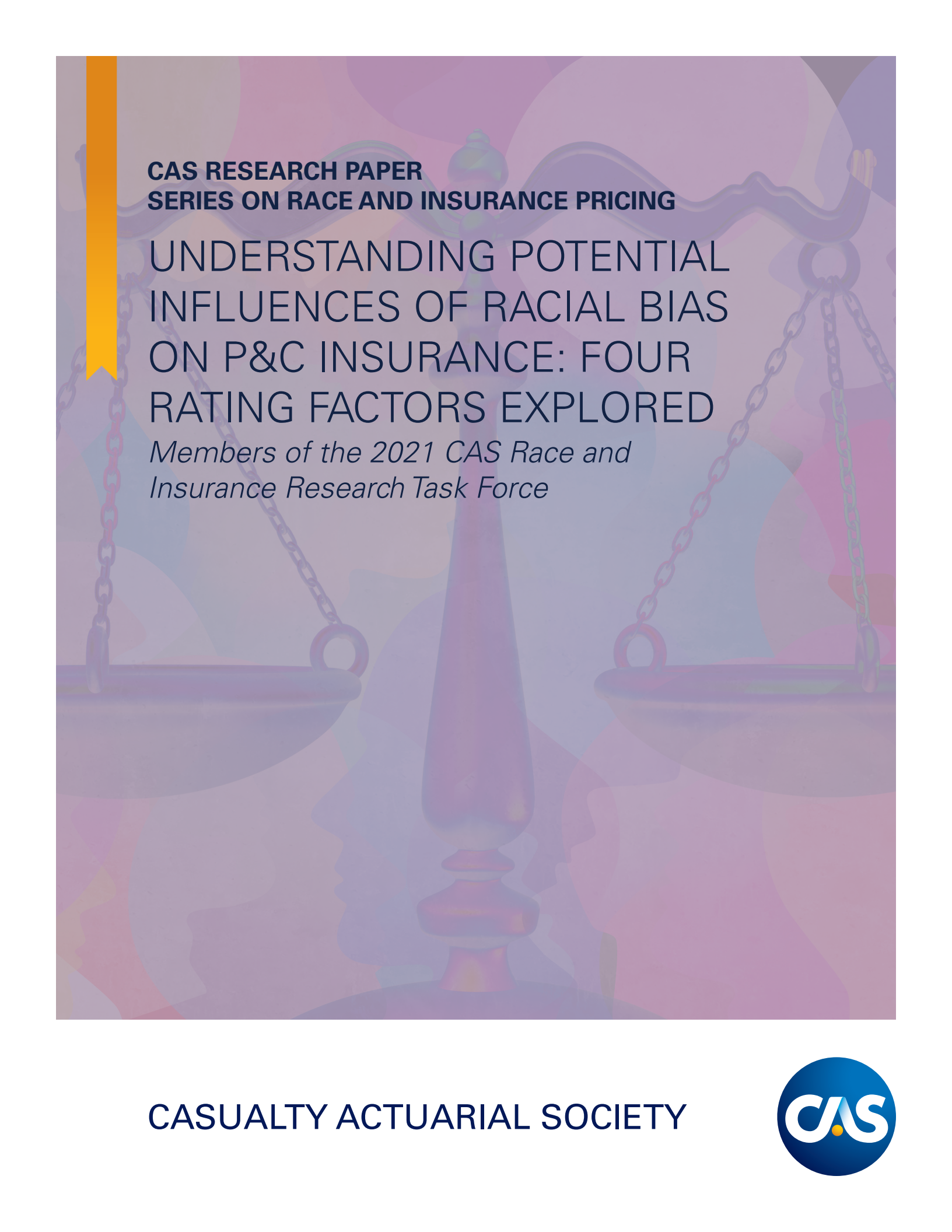




**CAS RESEARCH PAPER
SERIES ON RACE AND INSURANCE PRICING**

UNDERSTANDING POTENTIAL INFLUENCES OF RACIAL BIAS ON P&C INSURANCE: FOUR RATING FACTORS EXPLORED

*Members of the 2021 CAS Race and
Insurance Research Task Force*

CASUALTY ACTUARIAL SOCIETY



© 2022 Casualty Actuarial Society. All Rights Reserved.

Caveat and Disclaimer

This research paper is published by the Casualty Actuarial Society (CAS) and contains information from various sources. The study is for informational purposes only and should not be construed as professional or financial advice. The CAS does not recommend or endorse any particular use of the information provided in this study. The CAS makes no warranty, express or implied, or representation whatsoever and assumes no liability in connection with the use or misuse of this study. The views expressed here are the views of the authors and not necessarily the views of their current or former employers.

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

By Members of the 2021 Casualty Actuarial Society Race and Insurance Research Task Force

Executive Summary

Insurance rating characteristics have come under scrutiny by legislators and regulators in their efforts to identify and address racial bias in insurance practices. The goal of this paper is to equip actuaries with the information needed to proactively participate in industry discussions and actions related to racial bias and insurance rating factors. This paper uses the following definition of racial bias:

Racial bias refers to a system that is inherently skewed along racial lines. Racial bias can be intentional or unintentional and can be present in the inputs, design, implementation, interpretation, or outcomes of any system.

This paper will examine four commonly used rating factors in personal lines insurance — credit-based insurance score, geographic location, home ownership, and motor vehicle records — to understand how the data underlying insurance pricing models may be impacted by racially biased policies and practices outside of the system of insurance. Historical issues like redlining and racial segregation, as well as inconsistent enforcement of policies and practices contribute to this potential bias. These historical issues do not necessarily change the validity of the actuarial approach of evaluating statistical correlation of rating factors to insurance loss overall. Differences in the way individual insurers build rating models may produce very different end results for customers. More data and analyses are needed to understand if and to what extent these specific issues of racial bias impact insurance outcomes. Actuaries and other readers can combine this information with their own subject matter expertise to determine if and how this could impact the systems for which they are responsible, and what actions, if any, could be taken as a result.

**2021 CAS Race and Insurance Research Task Force
Contributing Members**

Mallika Bender, FCAS

Cherie Dill, FCAS

Meredyth Hurlbert, ACAS

Chuck Lindberg, FCAS

Sharon Mott, FCAS

1. Introduction

In December 2020, the Board of Directors of the Casualty Actuarial Society approved an organizational approach to issues of race and insurance, which focused on four key tactics: basic and continuing education, research, leadership and influence and collaboration. As the insurance industry once more turns its focus to potential racial bias across the spectrum of insurance processes and practices, it is imperative that actuaries are cognizant of these issues and how they will relate to their work.

The goal of this paper is to equip actuaries with the information needed to proactively participate in discussions and actions related to race and insurance. While this work is focused on race/ethnicity as a protected class in the United States and rating factors typically utilized in personal lines of insurance, much of what is learned from this effort can be applied to other protected classes, jurisdictions, and lines of business in the future.

The 2020 CAS Race and Insurance Working Group put forth the following definition of racial bias, which is important to understand before proceeding:

Racial bias refers to a system that is inherently skewed along racial lines. Racial bias can be intentional or unintentional and can be present in the inputs, design, implementation, interpretation, or outcomes of any system.

Insurance rating characteristics have come under scrutiny by legislators and regulators in their efforts to identify and address racial bias in insurance practices. Actuaries have developed the system of “risk-based pricing” to ensure that insurance premiums reflect the risk of loss posed by segments of policyholders. Race or ethnicity is a protected class, and therefore is not explicitly used to rate policyholders in current insurance rating plans. The definition above, however, acknowledges that racial bias can unintentionally be present in many aspects of a system, and thus it may be present despite explicitly excluding race/ethnicity information in insurance rating models.

This paper has set out to examine four commonly used rating factors in personal lines insurance — credit-based insurance score, geographic location, home ownership, and motor vehicle records — to understand how the data underlying insurance pricing models may be impacted by racially biased policies, and practices outside of the system of insurance. The goal of this work is not to suggest that any of these factors are inappropriate for use in insurance, but to highlight the multi-dimensional impacts of systemic racial bias, as it relates to insurance pricing.

This work is not comprehensive, nor is it prescriptive. There are many more factors used in insurance pricing and underwriting models that could either warrant further examination, or alternatively might serve to mitigate underlying bias when combined with the factors described in this paper. There are also many different possible ways to respond to the impacts of systemic racial bias laid out in this paper. Actuaries and other readers can combine this information with their own subject matter expertise to

determine if and how this could impact the systems for which they are responsible, and what actions, if any, could or should be taken as a result.

2. Credit-Based Insurance Scores

Credit report information is commonly used as a predictor of insurance losses, across several lines of business, including homeowners, renters, and auto insurance – this is achieved using credit-based insurance scores (CBIS). Before getting into the nuances of CBIS and any bias in the underlying information that determines such scores, it is necessary to establish the relationship between credit scores and CBIS. The algorithms underlying CBIS are proprietary and can differ from one insurance carrier to another, and therefore studies on racial bias impacting CBIS are difficult to find. However, there are several sources of information related to credit score and potential racial bias.

A credit score predicts credit delinquencies of financial transactions related to credit cards, mortgages, and other loans. Credit scores are not directly associated with the risk of an insurance loss (the chance of a claim and the size of a claim). CBIS, on the other hand, is intended to predict loss costs an insurance company may expect. The link between the two scores is clear and both are subject to Fair Credit Reporting Act (FCRA) regulations which address fairness, accuracy, and privacy of the personal information used by credit reporting agencies.

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.

While CBIS is predictive of insured loss, it is important to understand that historic and ongoing racial bias in various systems related to credit and credit reporting could lead to CBIS also being correlated with race.

The Equal Credit Opportunity Act (ECOA) of 1974 was initially intended to protect against credit discrimination due to sex and/or marital status such as documented discrimination at the time against unmarried women which prevented them from obtaining credit from banks (Burns 1979). In 1976 the ECOA was amended to also address discrimination on the basis of race, color, religion, national origin, age, receipt of income from public income programs or good faith exercise of any legally defined rights. While the ECOA made certain discriminatory practices in lending illegal, decades of past discrimination, such as

the “redlining” of Black and Hispanic neighborhoods — the history of which will be expanded upon in the next section — continue to have impacts on the financial well-being of these consumers today. Banks often refused to lend to non-White people or people living in lower income areas. The lack of access to loans can hurt an individual’s ability to pay bills and build wealth over time, which directly impacts the underlying information used to derive credit scores and CBIS (NCLC 2016). Furthermore, people in predominantly Black neighborhoods tend to be sued by debt collectors more often; a study found that even after accounting for income-level, the rate of judgements from debt collection lawsuits was twice as high in mostly Black communities as compared to White communities (Kiel and Waldman 2015). A lack of funds to pay for lawyers to defend against such suits could further bias the information utilized in credit reports.

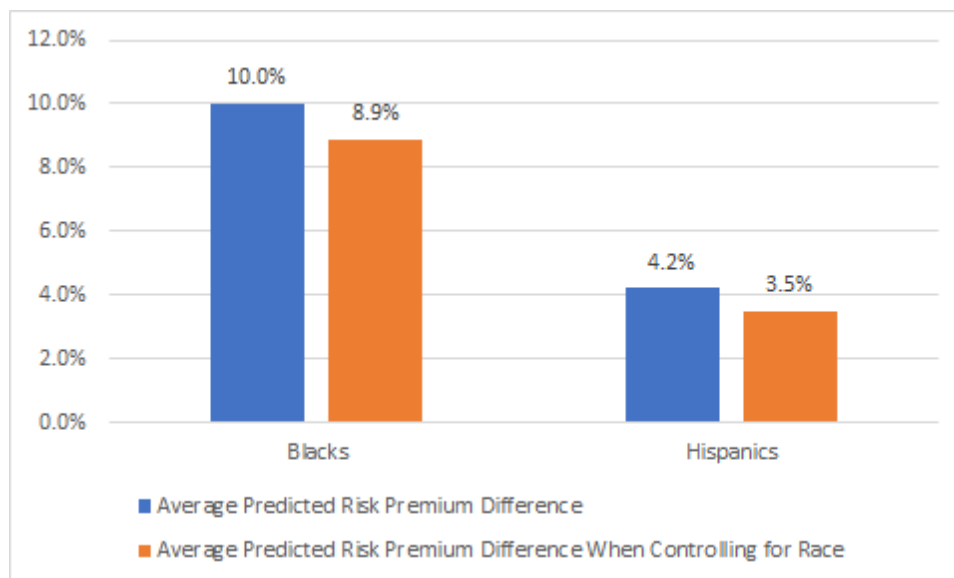
Furthermore, the credit report is not a perfect tool for reflecting a person’s financial status and history, as they may contain mistakes or missing information, or have methodological flaws. Flaws and inaccuracies in credit reporting may further contribute to racial bias in credit scores and CBIS. Some examples include the following:

- A 2013 Federal Trade Commission (FTC) study found that 5% of consumers had errors on their credit reports. Many consumers, especially those from communities of color and low-income backgrounds, may not be aware that these mistakes can be corrected, or may not be able to afford paid services that help consumers dispute inaccurate credit information.
- Approximately 26 million Americans are considered “credit invisible” — credit reporting agencies have no credit history for them. The Consumer Financial Protection Bureau found higher credit-invisibility rates among Black and Hispanic people and those living in low-income neighborhoods.
- While credit reports consider a consumer’s payment history over several years, they do not tend to include more current measures like cash flow and rent or utilities payments. One study showed that considering cash flow in credit scoring models increased the accuracy of the models overall, likely because it reflects more current status, rather than past financial distress, which may have a more negative impact on low income and minority communities (Campisi 2021). Rent and utility information could benefit Black and Hispanic consumers, who tend to have lower rates of homeownership, but have a reliable rental payment history. The credit-scoring industry is just beginning to take such information into account in alternative credit-scoring models.

While it is difficult to find studies that examine possible causes of bias in CBIS, in 2007, the FTC studied potential racial bias in outcomes of its use. The study concluded that CBIS resulted in higher insurance rates on average for Hispanic and Black people and noted that CBIS are distributed differently across different racial and ethnic groups. The analysis revealed that the use of CBIS in insurance premium determination increased the average predicted risk for Black and Hispanic people by 10% and 4.2%, respectively, after controlling for other standard risk factors, such as age and driving history. The same

study further sought to build an alternative credit-based insurance score that removed the impacts of race, ethnicity, and income in the modeling process. When doing so, the study concluded the average predicted risks for Black and Hispanic people were still 8.9% and 3.5% higher, respectively. This suggests that CBIS overall is not itself a strong proxy for race/ethnicity, but its use may increase insurance premiums for Hispanic and Black insureds more significantly than for other groups (FTC 2007).

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



While CBIS have clear correlations to insurance losses, care can be taken when attributing either credit scores or CBIS to factors within the control of the consumer. The evidence presented here suggests that historic racial bias in systems underlying the credit process have played a significant role in the skewness of credit-related scores by race. Further investigation is needed to understand the full implications and impacts of racial bias on CBIS.

3. Geographic Location

Geographic location is an important rating variable for many lines of insurance, as frequency and severity of loss can vary significantly by location.

For vehicle lines of insurance, the association with loss may be related to factors such as traffic, population density, weather, crime rates, and repair costs. The location insurers use in rating is generally based on where a customer lives. This is because most accidents occur close to home, making place of residence a useful proxy for accident location; a 2001 study by Progressive found that 52% of car accidents occur within 5 miles and 77% of accidents occur within 15 miles of home (*Autoweek* 2002). Advances in

technology like telematics may allow insurers to consider not only where the customer lives, but also where they drive, in determining rates.

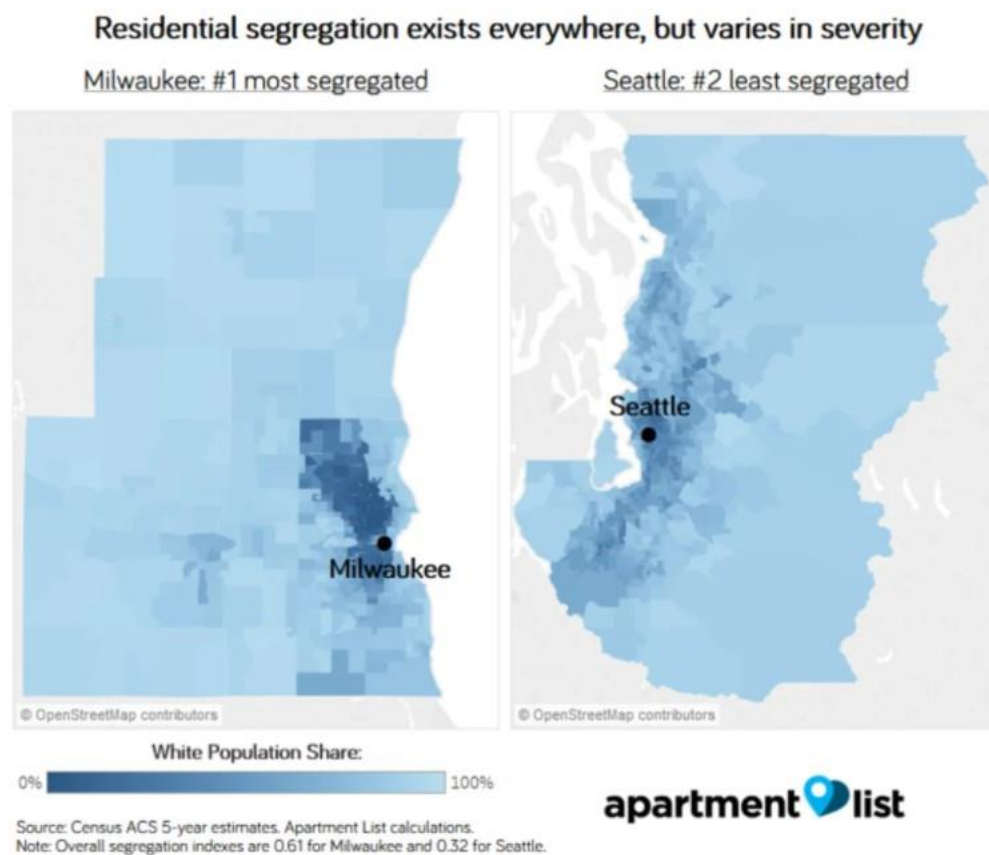
For property lines of insurance, the association with loss may be related to many factors such as age of home,¹ construction type,² proximity of fire services, crime rates and weather, including the risk of natural catastrophes. While the use of geographic location is supported by the correlation to loss, location may also be correlated with race due to ongoing societal segregation.

The Fair Housing Act of 1968, passed on the heels of Martin Luther King Jr.'s assassination, prohibited discrimination on the basis of race in sales and rentals of housing. Despite the passage of this act decades ago, studies show that segregation still persists in urban areas nationwide today. A 2018 study on segregation calculated a "segregation index" for 50 of the nation's largest cities defined as "the percentage of the minority group that would need to move to a different neighborhood in order for the distribution of minorities in each neighborhood to match that of the metro as a whole." Nationally, 59% of Black people and 47% of Hispanic and Asian people would need to move in order to create more integrated neighborhoods. Looking at individual cities, Milwaukee had the highest segregation index of 61% followed by New York City, Detroit, and Buffalo. Seattle had one of the lowest indices at 32% (Salviati 2018).

¹ Homes within the same geographic area tend to have been built around the same time. Older homes tend to have a greater frequency and severity of claim costs for various reasons. For example, older homes may not meet current building codes; outdated electrical wiring may be more exposed and lead to greater fire risk; outdated plumbing can tend to rust and lead to water damage. Hard-to-find materials can also increase replacement costs for older homes.

² Homes within the same geographic area tend to have the same construction type. Severity of loss varies by construction type and cause of loss. For example, brick homes are better able to withstand windstorms while frame homes are more resistant to earthquakes.

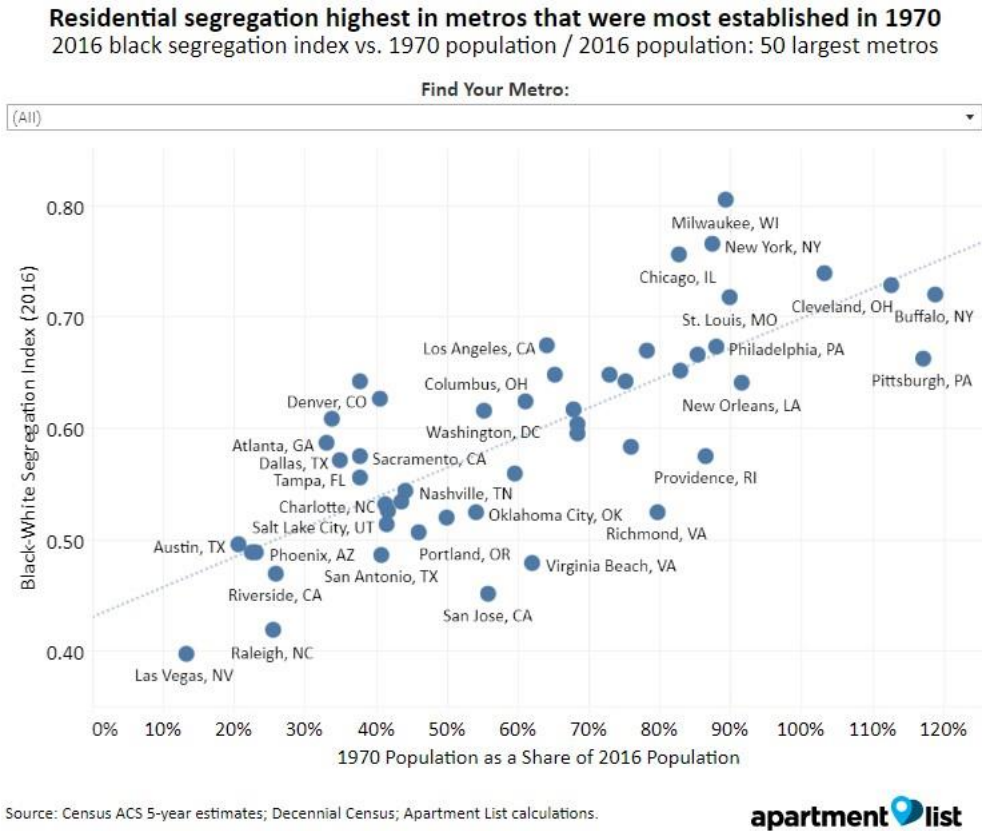
Figure 2. A Comparison of Segregation between Milwaukee and Seattle



Source: Chris Salviati, "The Persistent Effects of Residential Segregation," *Apartment List*. May 23, 2018.

The same study found that the longer established the urban area, the greater the amount of segregation that persists (see Figure 3); however, "minority populations tend to be more evenly distributed in areas that have experienced rapid growth in the decades since the passing of the Fair Housing Act" (Salviati 2018).

Figure 3. Residential Segregation vs Population Growth in U.S. Cities



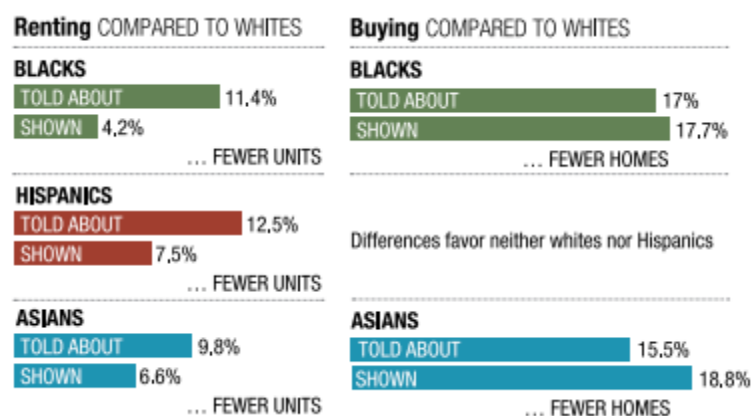
Source: Chris Salviati, "The Persistent Effects of Residential Segregation," *Apartment List*, May 23, 2018.

Historical policies and practices primarily directed at Black people have contributed to segregation. In the early 1900s, explicit segregation via city zoning ordinances was common practice. Segregation of communities by race was further reinforced through "redlining," or discriminatory lending practices such as denying mortgages, and hence homeownership, solely based on the race of the applicant (Greene 2017). The term "redlining" comes from the 1930s practice of the Home Owners' Loan Corporation, which had a policy of color-coding maps of "preferred" neighborhoods, with neighborhoods deemed "undesirable" colored red (Doan 2017). By the end of the 1940s, racially restrictive covenants were commonplace — over 80% of Chicago and Los Angeles carried covenants banning Black people from living in certain neighborhoods (Greene 2017). However, even with civil rights legislation prohibiting overt discrimination, residential segregation continued by means of "race neutral" methods, such as zoning policies that mandated large lot sizes and large square footage, thereby making it difficult for lower income people — often minorities — to move to certain communities (Greene 2017).

Greene (2017) also discusses how preferences can also influence where people live although these preferences may still be driven by societal stereotypes. Fear is often highlighted as a force that prevents integration — for example, fear of hostility from

White neighbors prevents some Black families from moving. Income can also play a role as Black people with higher income are more willing to live in integrated settings. Interestingly, research has shown that if households were distributed across neighborhoods based only on income, levels of Black/White segregation would significantly decrease (Greene 2017). While multi-ethnic neighborhoods are growing in number, they are not the dominant destination when people move. 75% of White people leaving a mostly White neighborhood move to another one while 60% of Black people leaving a mostly Black neighborhood move to another one. Even after controlling for economic factors like income, education and home ownership, differences in residence remain (Pappas 2012). While self-selection may play a role in how people move, bias in awareness of housing opportunities also factors in. A 2012 Housing Discrimination Study found that when home seekers inquire about recently advertised house units, White home seekers are more likely to be favored than minorities. Furthermore, minority home seekers are told about and shown fewer homes and apartments than their White counterparts (Turner 2013). (See figure 4.)

Figure 4. Minority Homeseekers Told About and Shown Housing Units



Source: Turner, et al., "Housing Discrimination Against Racial and Ethnic Minorities 2012," The Urban Institute, U.S. Department of Housing and Urban Development. June 2013.

While neighborhoods become and remain segregated based on race, particularly in urban areas, homes within a neighborhood tend to share common characteristics. Homes in urban communities tend to be older and have older electrical and heating systems. Older wood frame homes pose greater fire risk and density of housing increases the potential for fires to spread. Theft/crime rates also tend to be higher in urban areas (Squires 2006). While these variables may seem race-neutral on the surface and individually correlated with higher losses, the concentration of homes with these common characteristics may mean the higher territorial premiums associated with higher predicted losses are also correlated with race.

In a 2006 article on the use of geographic rating territories, Dane discusses how the definition of territory boundaries can play a large role in the correlation of higher

losses/premiums and race. When territory boundaries are chosen based on political boundaries such as at the city or county level, territory residents are more likely to be racially diverse. Finer boundaries such as zip code or latitude/longitude produce territories that are more likely to be dominated by one racial group. Seemingly neutral criteria for defining boundaries such as waterways, railroad tracks or highways, can yield racial correlations since segregated neighborhoods tend to demarcate along such features (Dane 2006). Side effects of the Federal Highway Act of 1956 include a shift of jobs from urban areas, a “White flight” from the city and a tendency to demarcate neighborhoods along racial lines (Powell 2008). Furthermore, highways and later interstates were often built through neighborhoods, frequently destroying them. They were also used to keep Black and White neighborhoods separate. A blatant example of this practice was the construction of Interstate 20 in Atlanta during the late 1950s, which was plotted along a winding route to serve, in the words of the mayor, as “the boundary between the white and Negro communities” on the west side of town. Even today, major highways tend to divide Black and White sections of large cities, including Buffalo, Hartford, Kansas City, Milwaukee, Pittsburgh, and St. Louis (Kruse 2019).

It is important to also be aware of the disproportionate impact of natural disasters on minority groups. In a 2017 article on the impact of hurricanes on the poor, Krause explains why low-income and minority communities are more vulnerable during natural disasters and have a more difficult time recovering than higher-income communities. Substandard infrastructure in affordable housing units and low-income communities place residents at greater risk of effects from a severe storm. For example, lower-income neighborhoods were more affected by Hurricane Harvey than wealthier ones because they were more concentrated in flood-prone parts of Houston. Poorer families are also less insulated from the economic shocks of natural disasters. In the counties most severely affected by Hurricane Harvey, only 17% of homeowners had flood insurance. Even with FEMA assistance, poor households affected by storm damage will likely have consequences for years to come. Hurricane Katrina had lasting effects on residents whose homes flooded, in the form of lower credit scores and lower rates of homeownership, compared to neighbors who did not experience flooding (Krause 2017). Furthermore, lower income communities may be less able to evacuate in a timely manner. They may also not be able to properly prepare and buy what resources they need to ride out the storm and take preventative action on their properties (Katz 2017).

Geographic location is a well-established variable in many lines of insurance. On the surface, there are many factors that could be used to explain the relationship of location to frequency or severity of loss. However, it is important to understand that location may also be correlated with race due to policies and practices that have led to segregation or a lack of diversity in many communities.

4. Homeownership

Homeownership is another important variable for pricing auto insurance. A 2016 study found that homeownership was used by almost all major carriers to differentiate auto rates and that renters paid an average of 6% more for basic auto liability insurance as compared to those who owned their homes (Consumer Federation of America 2016). This rating variable may be subjectively viewed as a measure of a policyholder's responsibility. However, not every policyholder has been afforded the same opportunity to become a homeowner. Homeownership and race are inextricably linked due to historic and ongoing practices of racial discrimination in mortgage lending and redlining.

To understand the landscape of homeownership differences by race, one must first understand the historical context. In the United States post-Civil War period, the practice of stealing land and property from Black people was commonplace through both legal and illegal means. Legal methods included "eminent domain," in which the state took control of private property owned by Black people. Outside of the law, buildings containing the deeds of Black-owned lands were burned, and in their wake, White landowners would claim larger and larger portions of land (Lewan and Barclay 2002). Intimidation tactics were also used, pushing Black landowners to abandon property outright. In an 18-month investigation, the Associated Press identified "107 land-takings in 13 southern and border states" during the 19th and 20th centuries. Despite the magnitude of land-takings described in the study, the findings represent "just the tip of one of the biggest crimes of this country's history" (Lewan and Barclay 2002).

Discrimination did not cease as the great migration pushed Black people out of the South. Residents of Black neighborhoods were systematically refused mortgages by the Federal Housing Administration (FHA) (Doan 2017). Meanwhile, the FHA provided subsidies for builders working on major subdivisions for White Americans through New Deal initiatives. This period has been labeled the largest-scale wealth building period in American history (Gross 2017). Even so, Black homebuyers were excluded from the legitimate home mortgage market, forcing them into secondary markets with predatory lending practices and few protections under the law. One of these practices was offering mortgages with extremely high interest rates, making it harder to keep up with the home loan. Another practice was to encourage buying a home "on contract," an agreement where the buyer was not able to build any equity in the home until the entire loan had been paid. These buyers could be evicted if even a single payment was missed (Coates 2014).

Through the work of Civil Rights activists and politicians, legal reform such as The Fair Housing Act of 1968 and the Equal Credit Opportunity Act of 1974, referenced in previous sections, began to address these issues. Despite the passage of these bills, redlining remained a significant problem. Congressional discourse turned to increasing focus on reporting requirements for banks (Congressional Record 1975). The Home Mortgage Disclosure Act (HMDA), passed in 1975, required banks to disclose their mortgage lending

practices by zip code. The Community Reinvestment Act (CRA), passed in 1977, attempted to increase lending in low- to middle-income communities.

Racial discrimination in lending remains a significant issue to this day. The U.S. Department of Housing and Urban Development (HUD) and the Federal Housing Assistance Program (FHAP) are responsible for enforcing the Federal Housing Act at federal and local levels. Complaints to these agencies have trended down over the years, but remain at high levels, as seen in Figure 5. In 2019, 7,729 complaints were filed with the HUD and FHAP agencies, of which 2,002 were complaints of racial discrimination, the second highest category of complaints for any of the classes protected by the Fair Housing Act (HUD, 2009-2019).

Figure 5. Complaints filed with HUD and FHAP 2006-2012.

FY (Fiscal Year)	2006	2007	2008	2009	2010	2011	2012
Complaints filed*	10,328	10,154	10,552	10,242	10,155	9,354	8,818
Monetary Relief**	-	-	-	-	8M	11M	372M
Complaints of Racial Discrimination	4,043	3,750	3,669	3,203	3,483	3,025	2,597

FY	2013	2014	2015	2016	2017	2018	2019
Complaints filed*	8,368	8489	8,246	8,385	8,186	7,788	7,729
Monetary Relief**	60M	25M	225M	25M	9M	18M	17M
Complaints of Racial Discrimination	2,337	2,383	2,291	2,180	2,153	2,049	2,002

*Includes all protected classes of FHA, not just race.

**2012 Includes large Wells Fargo redlining settlement; 2015 Includes large Associated Bank redlining settlement. Monetary relief prior to 2010 was not available.

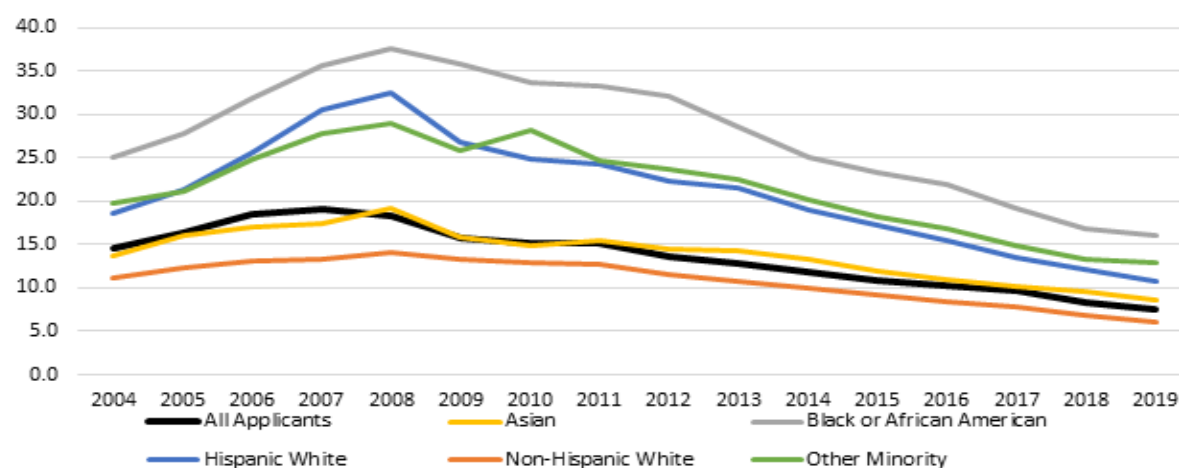
Source: U.S. Department of Housing and Urban Development, Annual Report on Fair Housing, 2011 – 2019.

Over the past 10 years, there have been multiple large-scale investigations of racial discrimination in mortgage practices, resulting in damages in hundreds of millions of dollars. In 2012, Wells Fargo paid more than \$175M to resolve fair lending claims. Between 2004 and 2008, Wells Fargo engaged in a practice known as “steering,” where

Black and Hispanic borrowers were encouraged to take out subprime loans, while similarly qualified White borrowers received more favorable loans. Additionally, Black and Hispanic consumers were subject to higher fees than their White counterparts (DOJ 2012). A few years later, in 2015, Associated Bank paid more than \$200M for denying mortgage loans to Black and Hispanic customers between 2008 and 2010, and for not writing loans in majority-minority census tracts in five metro areas (Sullivan 2015).

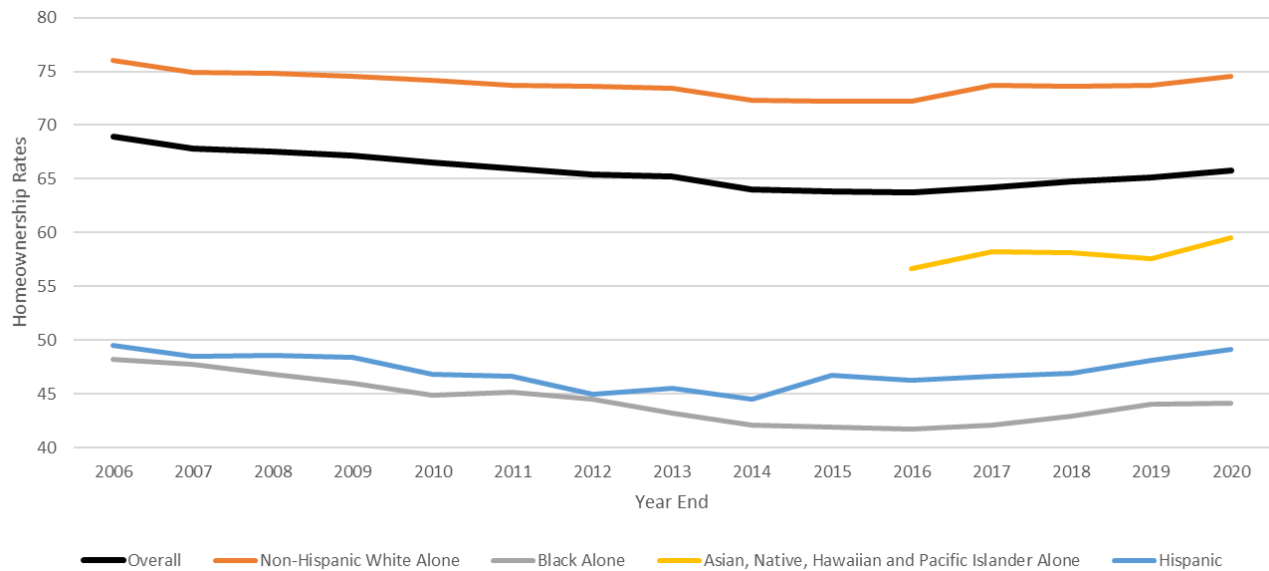
These practices have contributed to tangible differences in mortgage denial and in housing rates by race in today's housing market. In 2019, home loan denial rates for similarly qualified applicants were consistently worse for Black and Hispanic applicants as compared with White applicants, as shown in Figure 6. This relationship is echoed in homeownership rates, defined as the proportion of households that are owner occupied. Consistently, White Americans enjoy a higher homeownership rate than other groups, as shown in Figure 7.

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



Source: Consumer Financial Protection Bureau. June 2020.

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



Source: United States Census Bureau. April 2021.

Just as natural disasters have a disproportionate impact on minority and low-income communities, redlining and predatory lending may also contribute to a more significant impact of economic catastrophe on minority communities. In 2008, the effects of the housing bubble burst were felt by everyone in America, but Black and Hispanic neighborhoods were more severely harmed. A history of sub-prime lending and redlining set the stage for this disproportionate impact when the bubble burst. Even after controlling for the effects of variables related to income and housing value, neighborhoods with highly concentrated Black and Hispanic populations saw more foreclosures in 2006-2008 than neighborhoods with concentrated White and Asian populations (Rugh and Massey 2010). Black and Hispanic homebuyers also experienced a slower return to normal in terms of opportunity to secure a loan after the 2008 financial crash. White Americans returned to their 2004 levels of home denial rates by 2012, whereas Black and Hispanic Americans did not return to their 2004 levels until 2014 (Table 1).

Regulators are increasingly scrutinizing insurance rating variables like homeownership. Discussions of the National Association of Insurance Commissioners (NAIC) in 2020 have asked questions about homeownership as an income proxy and have made calls to refresh dated redlining studies. With the increased attention from regulators, lawmakers, and consumer groups, it is important to understand the environment that creates systematic differences in homeownership rates across racial groups, and to examine historic perceptions of homeownership as a measure of financial responsibility.

5. Motor Vehicle Records

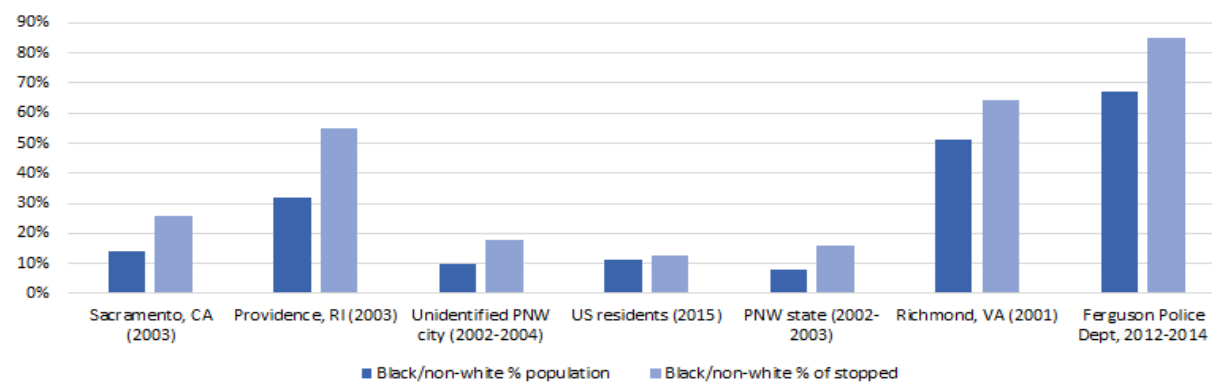
Information in the motor vehicle report (also known as driving record or MVR) is often used as an indicator of one's accident potential. It is commonly used in the pricing of auto policies and in some life insurance policies. There is an array of information in the motor vehicle report that allows insurers to assess one's propensity to loss and risk characteristics for a potential accident. Much like credit-based insurance scores, insurers have various individual guidelines for using motor vehicle reports in risk selection as well as in determining the final rate. Many studies have shown that past driving performance is indeed related to future driving performance; thus, it appears reasonable to consider MVR information in insurance ratemaking. However, due to the subjectivity around the application of traffic law enforcement processes and the systematic disparities in its application across different sectors and communities, it is possible that the information presented in the motor vehicle report is also related to other factors not associated with risk potential.

Given the current climate in which there are many conversations around policing practices and potential disproportionate enforcement and impact on Black people, it is reasonable to question whether and how using motor vehicle reports in insurance rating may contribute to racial bias in insurance rates. This section examines potential racial biases in stop and search practices, judicial processes and ticket outcomes that influence the factors that form one's motor vehicle record. While the results vary across the studies, common themes and take-aways for consideration when including MVR data in insurance pricing are highlighted here.

Several studies on traffic stops indicate that Black and other minority drivers are stopped at a disproportionately higher rate than White drivers. One study indicated that Black drivers were more likely to be pulled over for a traffic stop than White and Hispanic drivers — a difference of 1.2 and 2.2 percentage points, respectively. Black drivers also had a materially higher chance of being stopped multiple times — 18% versus 12% for Whites and 14% for Hispanic drivers (Davis, Whyde, and Langton 2018). Another study on racial disparities in police contact in Sacramento, California showed that 26% of the drivers stopped by police for traffic violations in that city were Black, despite Black people accounting for only 14% of the city's residents (Greenleaf, Lurigio, Flexon, et al. 2011). A similar finding in a study in Providence, Rhode Island showed 55% of police stops involved people of color, though they made up only 32% of registered drivers (McDevitt, Farrell, & Yee, 2003). In Washington state, a study concluded that state highway patrol officers were more likely to give citations to Black drivers than White drivers (Greenleaf, Lurigio, Flexon, et al. 2011). A Department of Justice report revealed that in 2011 Black drivers were 31% more likely to be pulled over than White drivers and more recently, the Stanford Open Policing Project concluded that Black drivers are 21% more likely to be pulled over than White drivers (Racial Justice Project, 2020).

Figure 8 summarizes findings across various studies of traffic stops. Certain studies focused only on Black drivers, while others included all non-White drivers, thus these terms are used interchangeably in the chart based on the data provided.

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



Some studies cited the disparity to be marginal such that Black drivers were only slightly more likely to be stopped than White drivers. However, their findings showed the disparity was larger when viewing the treatment of the drivers (i.e., whether given a warning or citation, searched, arrested etc.) after they were stopped. One study found that White drivers were released with just warnings 5.6% more frequently than Black drivers, and 5.0% more frequently than Hispanic drivers. The Hispanic group had the greatest percent of drivers who were issued tickets (56% versus 50% of Black drivers and 46% of White drivers) (Davis, Whyde, and Langton, 2018). Another study indicated that White drivers were warned most frequently overall, and Hispanic drivers were cited the most. However, when including gender in the analysis, they found Black male drivers were warned at the highest rate of any group (Tillyer and Engel 2010). Police officers who exhibit a bias in their attitude or behavior towards different races may also be influenced by this bias in their decision on whether or not to issue a citation to a driver. A survey of police officers in the United States revealed differences in how White and Black police officers viewed treatment of non-White people — “more than half of Black officers, compared with just 17 percent of White officers, agreed or strongly agreed that Whites received ‘better treatment’ than Blacks.” This perception held by Black officers was further supported by an evaluation of video-recorded traffic stops occurring in Oakland, California (National Academies of Sciences, Engineering, and Medicine 2018).

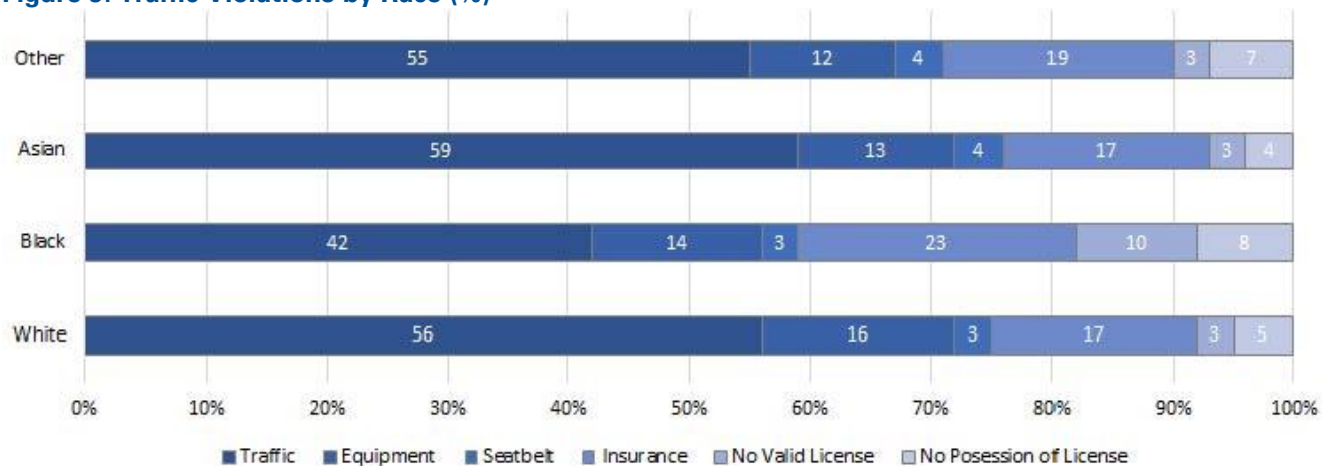
Three theories were presented on possible causes for the disparities: 1) Police exercise a high level of discretion at traffic stops; this combined with experiences and social conditioning may create a bias against certain demographic groups; 2) Non-White drivers were more likely subjects of “pretextual” stops, i.e. the stop was not related to how they were driving, but rather used as an opportunity to investigate or search for other offenses; and 3) Police tended to be more active in “disorganized neighborhoods” in which structural issues “impede development of formal and informal ties that promote

the community's ability to solve problems" (Parker et al. 2004). Thus, citations serve as a way for officers to deploy control in those neighborhoods that lack the necessary structure for citizens to maintain order on their own, resulting in more traffic stops in these areas (Ingham 2007). These are neighborhoods characterized by low economic status, racial segregation, residential instability, and high crime rates and tend to be disproportionately comprised of majority-minority populations.

The theories above suggest that an increase in traffic enforcement may not be indicative of an actual increase in potential accident exposure or reckless driving, and bias may play a role in the decision to stop. Furthermore, one study indicated that Black drivers were least likely to have contact with traffic enforcement due to an actual accident (Davis, Whyde, and Langton, 2018). In addition, some studies showed that a higher proportion of the traffic stops involving Black drivers resulted in the case being thrown out for lack of evidence, lack of probable cause, or the driver being let go with a warning. This suggests that in many cases the stops may have been unwarranted. This phenomenon was supported by a study of drivers' perceptions of their own traffic stops, in which a materially higher percent of Black drivers felt their traffic stops were illegitimate (Davis, Whyde and Langton 2018).

While the studies presented here provide evidence of racial bias in traffic stops, it is not clear that these stops alone translate to a negative impact on one's motor vehicle records, whereas citations or charges are more likely to show up in the MVR. As mentioned previously, one study showed that Black drivers were more likely to have their case dismissed (three times more than White drivers), due to lack of probable cause or lack of substantial facts in support of the charge (Greenleaf, Lurigio, Flexon, et al. 2011). A review of citation categories by race found that Black drivers were less likely than other groups to be cited for moving violations or traffic infractions, and more likely than others to be cited due to insurance or license-related infractions, as shown in Figure 9.

Figure 9. Traffic Violations by Race (%)



Source: Greenleaf et al., 2011.

It can be argued that lapsed insurance or driving without a license could be an indication of one's respect for traffic laws and other drivers on the road, and thus could present a moral hazard to insurers; however, there are other factors that contribute to the larger chance of minority groups failing to have the appropriate insurance and license. Studies suggest this is driven more by socioeconomic status and may not necessarily be reflective of one's degree of caution when driving on the road.

Another factor that is worth reviewing further is that Black drivers failed to appear in court or forfeited cases almost three times more than other races (Greenleaf, Lurigio, Flexon et al. 2011). Again, one could argue this is an indicator of a disregard for laws which could increase risk to insurers; however, this phenomenon may also be tied to socioeconomic status. There are a number of socioeconomic factors that limit one's abilities to defend a case and/or show up in court, such as being unable to miss work without penalty. As stated previously, minorities were more likely to be cited without probable cause, thus failure to appear in court may lead to infractions on one's driving record that may have been dismissed or removed had the driver been present in court. It may be useful to further examine how economic status and other social circumstances may impact one's ability or willingness to appear in court to defend a case.

Black drivers may be more likely to be arrested for driving with a suspended license — one study showed that Black drivers are three times more likely to be ticketed for driving without a license (Greenleaf, Lurigio, Flexon et al. 2011). The most common cause of suspended licenses was failure to appear in court or non-payment of fines. Cited individuals may be unable to pay their citations due to financial hardship or they may miss court appearances for fear of being arrested, and have their license suspended as a result (New York Law School, Racial Justice Project 2020). In addition, a driver's license may be suspended for a variety of reasons unrelated to traffic violations. For instance, some jurisdictions suspend licenses for failure to pay child support or student loans. The study found that arrests for driving with a suspended license were concentrated in Black or Hispanic neighborhoods where poverty and unemployment rates were highest (New York Law School, Racial Justice Project 2020). A conviction for driving with a suspended license can result in points on a driver's MVR. This is one instance where racial bias may be directly transferred into auto insurance prices through offenses not related to driving.

While several studies show disparities in the application of traffic policies amongst different racial groups and disproportionate outcomes of traffic offenses seemingly correlated to certain racial or ethnic groups, there is not strong enough evidence to support a clear racial bias in motor vehicle record overall. In addition, not all studies clearly point in one direction (some did not identify material disparities due to race). However, there are clear indications of disproportionately higher frequency of minority groups interactions with traffic police, possibly leading to increased citations. The interaction of other variables such as location and socioeconomic status may have an influence on these outcomes. It is further clear that offenses not related to driving practices penalized Black, minority and/or low-income groups more than White groups,

and these offenses often have limited relationship to actual hazard on the road. There is room for more research on how one's race combined with location, household income, demographic of the neighborhood being driven in, and other factors may result in Black and other minority drivers being stopped, ticketed, and convicted more than White drivers. While the data suggests there may be underlying bias in components of the MVR, further study is needed to understand how this may impact outcomes in insurance rating.

6. Moving Forward

The studies presented here have illustrated the ways in which implicit biases and explicit discrimination could potentially contribute to racially skewed distributions underlying common insurance rating factors. Insurers utilize the factors examined in this paper — credit-based insurance scores, geographic location, homeownership, and motor vehicle records — because they all have demonstrated correlations to insurance loss. While there may be explanations for those correlations, there is value in further understanding the complex historical and current issues impacting these multi-dimensional factors. Actuaries and insurance professionals, as a first step, may apply the information provided in this paper as they reconsider value judgments and stereotypes often assigned to policyholders concentrated in higher insurance risk categories.

Stakeholders rely on actuaries to understand and interpret data responsibly – that may include an awareness of the history of racial bias and how it may manifest in their work. Each insurance company uses its own unique combination of data, rating variables, and categorizations. One rating factor, when subdivided in different ways or when combined with dozens of other factors in a rating model, may produce very different outcomes for the policyholder. More research and analysis can shed light on the impact of societal bias on individual rating factors or insurance rating models overall. The insurance industry will continue to benefit from actuarial expertise as it explores how to appropriately identify and address unintended racial bias in insurance pricing. Actuaries with an understanding of the complexities of the data they work with will be able to proactively support that effort within their own companies to ensure prices adequately reflect risk of loss, while mitigating the influence of racial bias, where possible.

Research and education are vital to the success and evolution of the Casualty Actuarial Society (CAS), the actuarial profession, and the broader insurance industry. As the industry discourse on potential bias in insurance pricing evolves, the CAS will continue to develop resources to support members and industry professionals and is open to collaborating with others. As the CAS pursues further research and educational opportunities and the development of new approaches to address these issues, we invite anyone interested in collaborating with the CAS on future research or educational sessions to reach out by sending an email to diversity@casact.org.

References

- [1.] *Autoweek*, "Survey finds vehicle crashes most likely to occur close to home," May 8, 2002, <https://www.autoweek.com/news/a2108966/survey-finds-vehicle-crashes-most-likely-occur-close-home/>.
- [2.] Bingham, Stephen, et al., "Stopped, Fined, Arrested — Racial Bias in Policing and Traffic Courts in California," *Back on the Road California (BOTRCA)*, April 2016.
- [3.] Burns Jr., James A., "An Empirical Analysis of the Equal Credit Opportunity Act," 13 *University of Michigan Journal of Law Reform*, 102, 1979, <https://repository.law.umich.edu/mjlr/vol13/iss1/6>.
- [4.] Campisi, Natalie, "From Inherent Racial Bias to Incorrect Data — The Problems with Current Credit Scoring Models," *Forbes Advisor*, 2021, <https://www.forbes.com/advisor/credit-cards/from-inherent-racial-bias-to-incorrect-data-the-problems-with-current-credit-scoring-models/>.
- [5.] Coates, Ta-Nehisi, "The Case for Reparations," *The Atlantic*, June 2014, <https://www.theatlantic.com/magazine/archive/2014/06/the-case-for-reparations/361631/>.
- [6.] *Congressional Record*, September 4, 1975, 94th Congress, 1st Session. <https://www.congress.gov/bound-congressional-record/1975/09/04/senate-section>.
- [7.] Consumer Federation of America, "Good Drivers Pay More for Basic Auto Insurance If They Rent Rather Than Own Their Home," February 8, 2016, https://consumerfed.org/press_release/good-drivers-pay-more-for-basic-auto-insurance-if-they-rent-rather-than-own-their-home/.
- [8.] Dane, Stephen M., "The Potential for Racial Discrimination by Homeowners Insurers Through the Use of Geographic Rating Territories," *Journal of Insurance Regulation*, 24:4, Summer 2006, <https://naic.soutronglobal.net/Portal/Public/en-US/RecordView/Index/6096https://naic.soutronglobal.net/Portal/DownloadImageFile.ashx?objectId=2801>.
- [9.] Davis, Elizabeth, Anthony Whyde, and Lynn Langton, "Contacts Between Police and the Public, 2015," Bureau of Justice Statistics Special Report, NCJ 251145, October 2018, <https://bjs.ojp.gov/library/publications/contacts-between-police-and-public-2015>.
- [10.] Doan, Michael, "Epistemic Injustice and Epistemic Redlining," *Ethics and Social Welfare*, February 22, 2017, 11(2):177-190, DOI: [10.1080/17496535.2017.1293120](https://doi.org/10.1080/17496535.2017.1293120).
- [11.] Eger, Robert J., C. Kevin Fortner, and Catherine P. Slade, "The Policy of Enforcement: Red Light Cameras and Racial Profiling," *Policy Quarterly*, pp. 1-17, 2015, <http://dx.doi.org/10.1177/1098611115586174>.
- [12.] Federal Trade Commission (FTC), "Credit-Based Insurance Scores: Impacts on Consumers of Automobile Insurance," July 2007, https://www.ftc.gov/sites/default/files/documents/reports/credit-based-insurance-scores-impacts-consumers-automobile-insurance-report-congress-federal-trade/p044804facta_report_credit-based_insurance_scores.pdf.
- [13.] Greene, Solomon, Margery Austin Turner and Ruth Gourevitch, "Racial Residential Segregation and Neighborhood Disparities," U.S. Partnership on Mobility from Poverty, Urban Institute, August 2017, <https://furtheringfairhousing.mit.edu/sites/default/files/documents/racial-residential-segregation-and-neighborhood-disparities.pdf>.

- [14.] Greenleaf, Richard G., et al., "Race-Based Decisions: Traffic Citations and Municipal Court Dispositions," *Justice Policy Journal*, The Center of Juvenile and Criminal Justice, 8(1), Spring 2011, http://www.cjcj.org/uploads/cjcj/documents/Race-based_decisions.pdf.
- [15.] Greenleaf, Richard G., Wesley G. Skogan and Arthur J. Lurigio, "Traffic Stops in the Pacific Northwest: Competing Hypotheses About Racial Disparity," *Journal of Ethnicity in Criminal Justice*, 2008, 6(1);3-22, DOI: [10.1300/J222v06n01_02](https://doi.org/10.1300/J222v06n01_02).
- [16.] Gross, Terry, "A 'Forgotten History' of How the U.S. Government Segregated America," National Public Radio, March 3, 2017, <https://www.npr.org/2017/05/03/526655831/a-forgotten-history-of-how-the-u-s-government-segregated-america>.
- [17.] Ingham, Jason R., "The Effect of Neighborhood Characteristics on Traffic Citation Practices of the Police," *Policy Quarterly*, 10:4, pp. 371-393, December 1, 2007, DOI: [10.1177/1098611107306995](https://doi.org/10.1177/1098611107306995).
- [18.] Jo, Young et al., "Data Point: 2019 Mortgage Market Activity and Trends," Consumer Financial Protection Bureau, June 2020, https://files.consumerfinance.gov/f/documents/cfpb_2019-mortgage-market-activity-trends_report.pdf.
- [19.] Katz, Jonathan M., "Who suffer when disasters strike? The poorest and most vulnerable," *The Washington Post*, September 1, 2017, https://www.washingtonpost.com/outlook/who-suffers-when-disasters-strike-the-poorest-and-most-vulnerable/2017/09/01/0efab8a2-8e65-11e7-84c0-02cc069f2c37_story.html.
- [20.] Kiel, Paul, and Annie Waldman, "The Color of Debt: How Collection Suits Squeeze Black Neighborhoods," October 8, 2015, <https://www.propublica.org/article/debt-collection-lawsuits-squeeze-black-neighborhoods>.
- [21.] Krause, Eleanor, and Richard V. Reeves, "Hurricanes hit the poor the hardest," Brookings, September 18, 2017, <https://www.brookings.edu/blog/social-mobility-memos/2017/09/18/hurricanes-hit-the-poor-the-hardest/>.
- [22.] Kruse, Kevin M., "How Segregation Caused Your Traffic Jam," *The New York Times Magazine*, August 14, 2019, <https://www.nytimes.com/interactive/2019/08/14/magazine/traffic-atlanta-segregation.html>.
- [23.] Lewan, Todd and Dolores Barclay, "Torn from the land: Black Americans' farmland taken through cheating, intimidation, even murder," Associated Press and *The Seattle Times*, December 2, 2001, <https://archive.seattletimes.com/archive/?date=20011202&slug=torn02>.
- [24.] McDevitt, J., A. Farrell, and M. Yee, "Providence traffic stop statistics compliance report," Northeastern University, Institute on Race and Justice, October 31, 2003, <https://repository.library.northeastern.edu/files/neu:344642>.
- [25.] National Academies of Sciences, Engineering, and Medicine, *Proactive Policing: Effects on Crime and Communities*, 2018, pp. 251-301, Washington, DC: The National Academies Press, <https://doi.org/10.17226/24928>.
- [26.] National Association of Insurance Commissioners (NAIC), *Proceedings of the NAIC*, Summer 2020, <https://content.naic.org/sites/default/files/publication-prc-zs-summer-nm.pdf>.
- [27.] National Consumer Law Center (NCLC), "Past Imperfect: How Credit Scores and Other Analytics 'Bake In' and Perpetuate Past Discrimination," May 2016, Racial Justice and Equal Economic Opportunity Project, https://www.nclc.org/images/pdf/credit_discrimination/Past_Imperfect050616.pdf.

- [28.] New York Law School, "Driving while Black and Latinx: Stops, Fines, Unjust Debts," *Racial Justice Project*, 8, February 2020, https://digitalcommons.nyls.edu/racial_justice_project/8.
- [29.] Pappas, Stephanie, "Blacks and Whites Favor Same-Race Neighborhoods," *LiveScience*, May 31, 2012, <https://www.livescience.com/20663-black-white-segregated-neighborhoods.html>.
- [30.] Parker, Karen F., et al., "A Contextual Study of Racial Profiling: Assessing the Theoretical Rationale for the Study of Racial Profiling at the Local Level," *American Behavioral Scientist*, March 1, 2004, 47(7): 943-962, DOI: [10.1177/0002764203261073](https://doi.org/10.1177/0002764203261073).
- [31.] Powell, John, "Race, Place, and Opportunity," *The American Prospect*, September 21, 2008, <https://prospect.org/special-report/race-place-opportunity/>.
- [32.] Rugh, Jacob and Douglass Massey, "Racial Segregation and the American Foreclosure Crisis," *American Sociological Review*, 2010, 75(5):629-651, DOI: [10.1177/0003122410380868](https://doi.org/10.1177/0003122410380868).
- [33.] Salvati, Chris, "The Persistent Effects of Residential Segregation," *Apartment List*, May 23, 2018, <https://www.apartmentlist.com/research/persistent-effects-residential-segregation>.
- [34.] Squires, Gregory D., and Charis E. Kubrin, "Racial Profiling, Insurance Style: Insurance Redlining and the Uneven Development of Metropolitan Areas," *Journal of Urban Affairs*, 25(4):391-410, Summer 2006, DOI: [10.1111/1467-9906.t01-1-00168](https://doi.org/10.1111/1467-9906.t01-1-00168).
- [35.] Sullivan, Brian, "HUD & Associated Bank Reach Historic \$200 Million Settlement of 'Redlining' Claim," U.S. Department of Housing and Urban Development, May 26, 2015, <https://archives.hud.gov/news/2015/pr15-064b.cfm>.
- [36.] Tillyer, Rob and Robin S. Engel, "The Impact of Driver's Race, Gender and Age During Traffic Stops: Assessing Interaction Terms and the Social Conditioning Model," *Crime & Delinquency*, (First published November 28, 2010), 2013;59(3):369-395, <https://doi.org/10.1177/0011128710389583>.
- [37.] TransUnion, "Credit-Based Insurance Risk Scores and COVID-19: What You Need to Know," Insights and Events video, January 1, 2021, <https://www.transunion.com/videos/credit-based-insurance-risk-scores-and-covid-19>.
- [38.] Turner, Margery Austin, et al., "Housing Discrimination Against Racial and Ethnic Minorities 2012," The Urban Institute, U.S. Department of Housing and Urban Development, June 2013, https://www.huduser.gov/portal/Publications/pdf/HUD-514_HDS2012_execsumm.pdf.
- [39.] U.S. Census Bureau, "Quarterly Homeownership Rates by Race and Ethnicity of Householder: 1994 to Present," Table 16 of "Housing Vacancies and Homeownership (CPS/HVS)," November 2, 2021, <https://www.census.gov/housing/hvs/data/histtabs.html>.
- [40.] U.S. Department of Housing and Urban Development (HUD), "FHEO Annual Reports on Fair Housing" 2009-2019, Office of Fair Housing and Equal Opportunity (FHEO) Annual Reports to Congress, https://www.hud.gov/program_offices/fair_housing_equal_opp/annualreport.
- [41.] U.S. Department of Justice (DOJ), "Justice Department Reaches Settlement with Wells Fargo Resulting in More Than \$175 Million in Relief for Homeowners to Resolve Fair Lending Claims," July 12, 2012, <https://www.justice.gov/opa/pr/justice-department-reaches-settlement-wells-fargo-resulting-more-175-million-relief>.