Regulation and Discrimination: Race and Interest Rate Mark-Ups in the Auto Loan Industry

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I. Introduction

The Consumer Financial Protection Bureau (CFPB) established guidance on indirect auto lending in 2013 with the intent of lowering the rate of discriminatory lending in the auto industry. It has since been repealed in an unprecedented manner with Public Law 115 - 172 (Consumer Financial Protection Bureau, 2013; 115th Congress, 2018). The goal of the guidance was to hold indirect auto lenders responsible for discrimination in interest rates offered to customers of different groups due to mark-ups built into their bids. Congress repealed the guidance under the Congressional Review Act (CRA) in the summer of 2018. The guidance on indirect auto lending no longer holds any power over these indirect lenders' mark-up policies, and no future guidance can be put in place with similar parameters as a result of the repeal. This block on legislation relating to indirect lenders holds a large amount of power because they are the majority of the financial entities that financial actions can target within the auto loan industry. Additionally, as one of its flagship movements in the infancy of a new Bureau, the guidance is likely to set precedence for how the CFPB handles itself in the future. Now in hindsight, was the guidance by the CFPB on indirect auto lending effective in lowering discrimination in the auto loan industry?

While many other kinds of loans originate at a bank, approximately 80% of auto loans begin at the dealership (Cohen, 2012). This market expands further past the dealers who are mostly facilitators between indirect lenders and the customer. The range of these indirect lenders is vast; it contains banks who are legally defined as such, non-banks who offer many of the same services as banks but are not legally defined as a bank, and captive lenders who are associated with only certain manufacturers or dealers. Dealers are quoted interest rates at which different lenders will lend to the borrower as well as any additional pieces to the deal, such as the base rate for the financing and the amount the base rate can be marked up by the dealership. As a consumer attempting to purchase a car from a dealership, the process of financing a vehicle is different from obtaining a loan from a bank (See Figure 1). First, buyers meet with financing managers at the dealership and will give the financial manager their basic credit information. Next, the manager will send the information out to indirect lenders to receive quotes on financing deals or compare the information to quotes indirect lenders have pre-approved. These quotes for deals are where the indirect market has its opportunity to compete for the loans. After the manager decides which lender to use, the manager will negotiate the final deal, within the parameters set by the lender, with the consumer who is trying to finance a vehicle. So, while the final rate is set by the dealer, the final financing arrangement remains within parameters allotted by the indirect lender, such as the down-payment amount and APR.

The secondary market is hidden from the consumer and they are fed asymmetric information by the dealer. Borrowers will never have any contact or knowledge of the deals associated with the bidders for the loan. Borrowers are unsure of what a good deal is because it is difficult for them to gather all the information. The lack of knowledge creates an opportunity for lenders to exploit

information asymmetry because borrowers do not know what they should actually be charged. The problem of asymmetric information has long been studied by economists and continues its hold in this market (Guasch and Weiss, 1980; Harris and Townsend, 1981).
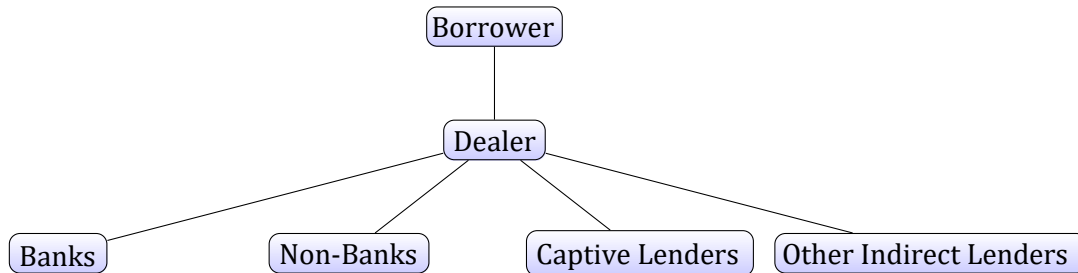

Figure 1. The Indirect Loan Process

Borrowers being taken advantage of or being mistreated is not a new topic of discussion. The most recent evidence was the poor lending practices that lead to the Great Recession of 2008 (Peterson, 2016). However, there are many more examples of poor and discriminatory practices occurring outside the mortgage market. There have even been new physical strategies for accepting poor loans with a high chance of default (Atta-Krah, 2016). Some dealers have turned to starter interrupter devices on these loans, so even if the borrower defaults the dealer will be able to retrieve their vehicle (Atta-Krah, 2016). Additionally, there have been several legal actions by consumers attempting to protect themselves from these practices (Cohen, 2012). Even industry members themselves have seen that these practices are inefficient (i.e. the Consumer First Financing Program [1]) (Cohen, 2012). The necessity of the CFPB to protect consumers comes into its light with the recognition of poor practices and systems.

This paper aims to measure the effects of the CFPB guidance by analyzing the difference between the periods before and during its implementation. Instead of measuring discrimination in the industry overall, this paper analyzes the effects of the guidance to determine its effectiveness at reducing discrimination. Under both Becker's "taste-based" discrimination and price discrimination, subjectivity is introduced to the lending process. The accountability of the indirect lenders by the guidance should theoretically reduce discrimination by adding consequences.

This paper utilizes Oaxaca-Blinder decomposition to determine the levels of discrimination occurring in periods before and after the guidance was put in place in order to analyze the effects of the guidance. Differences in credit worthiness and negotiation power between minority and non-minority groups causing differences in Annual Percentage Rate (APR) is captured in the decomposition; these differences represent differences in APR that are not a result of discrimination and reflects differences in buy-rates presented to dealers. However, the unexplained portion that is left represents disparity in APR rates that are not a result of any factors related to creditworthiness. Overall differences between minority and non-minority groups

increased in the period with the guidance in place. While the explained portion decreased, revealing there were less differences between groups, the unexplained portion's increase to a larger magnitude led to the overall increase. There is no decrease in discrimination resulting from the guidance, but possibly an actual increase during the period.

II. Literature Review

A. Consumer Protection

The most recent and widespread evidence of this is the poor lending practices that were a factor leading to the Great Recession of 2008 (Peterson, 2016). However, there are many more examples of poor and discriminatory practices occurring (Ayres, 1991; Ayres and Miller, 1990; Harless and Hoffer, 2002; Ladd, 1998). Additionally, there have been several legal actions by consumers attempting to protect themselves from these practices (Cohen, 2012). Even industry members themselves have seen that these practices are inefficient (i.e. the Consumer First Financing Program [2]) (Cohen, 2012). With this recognition of poor practices and systems, the necessity of the CFPB to protect consumers comes into its light.

Consumer protection from discrimination and inequality has been around for decades in the United States and remains an active topic. The movement to protect consumers from inequality in lending was headed by the Equal Credit Opportunity Act and the Fair Housing Act (Congress, 1974, 1968), but new movements have resurfaced recently. The Consumer Finance Protection Bureau (CFPB) was created in just 2010 in order to create a focus on protection of consumer finances (Seide, 2012). This comes in the light of financial distress and fear generated by the Great Recession of 2008 that was a direct result of the mortgage market (Peterson, 2016). The ripple throughout the economy caused increased foreclosures, crime, homelessness, unemployment, etc. (Peterson, 2016). Following the Great Recession, there was an increased focus on consumer financial protection since it was now known how large of an effect consumer finances could have on the macro-economy. Lax regulations and regulatory failures were among the main causes stated by Benjamin Bernanke, chairman of the Federal Reserve (Seide, 2012). The recognition of regulation being a failure sparked an overhaul in the regulation of financial institutions.

The 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) simultaneously created the CFPB with the same purpose: to protect consumer finances. In response to the crisis, the Dodd-Frank Act targeted the American financial services industry as a whole, covering a long list of reforms; some provisions included consumer protection, transparency and accountability relating to complex financial instruments, and systematic risk oversight (Seide, 2012). The overall goal of the list of reforms was to prevent financial institutions from, "committing unfair, deceptive, or abusive acts or practices ("UDAAP")," in order to prevent another recession like the Great Recession and to promote better practices within the industry (McDonald and Rojc, 2014). The tightened controls on the industry, primarily the mortgage industry, is largely due to the primary causes of the housing crisis. As Holt (2009) explores the housing bubble that was created, he attributed it to four primary causes: low mortgage interest

rates, low short-term interest rates, relaxed standards for mortgage loans, and irrational exuberance. All are items of which tightened standards and controls could help to address.

While the Dodd-Frank Act helped address best practices and controls, the Equal Credit Opportunity Act (ECOA) enacted in 1974 helped to establish laws to create equal opportunities for credit for all Americans. In its statement of purpose, Congress recognizes that there is a "need to insure that the various financial institutions ...exercise their responsibility to make credit available with fairness, impartiality, and without discrimination on the basis of sex or marital status" (Congress, 1974). Not only does Congress find it a responsibility to uphold fairness, but "economic stabilization would be enhanced and competition ...would be strengthened by an absence of discrimination" (Congress, 1974). The specific parameters set by the ECOA in the hopes of achieving these effects are as follows:

It shall be unlawful for any creditor to discriminate against any applicant, with respect to any aspect of a credit transaction (1) on the basis of race, color, religion, national origin, sex or marital status, or age (provided the applicant has the capacity to contract); (2) because all or part of the applicant's income derives from any public assistance program; or (3) because the applicant has in good faith exercised any right under this chapter. (Congress, 1974)

This basis sets up which factors cannot be discriminated against, but additionally it lays out the items that are allowed in the protection of creditors such as inquiring about marital status to determine the rights applicable for a borrower or to use a system which factors in age if the system is demonstrably and statistically sound (Congress, 1974). For example, age can be inquired and used for determination of the amount and continuance of income (Congress, 1974). This is necessary because someone reaching retirement age may not have the same continued level of income and may impact their creditworthiness. Additionally, it states that the CFPB is the primary bureau in charge of regulations and enforcement surrounding the act (Congress, 1974). This is the reason that the CFPB's guidance holds so much power.

B. The Auto Loan Market

The auto loan market is seemingly simplistic on its surface to satisfy customer needs, but what customers do not see is much more complex. Dealers are attempting to maximize their profits by both selling cars and providing financing (Cohen, 2012). Dealers attempt to keep this process self-contained because the profit on the loans assists with the low profit of the sale (average profit for a new car is a few hundred dollars) (Cohen, 2012). This ability to sell and finance cars allows dealers to keep as much of the profits in house as possible.

Borrowers entering this market are subject to unfamiliarity. Compared to mortgages, where banks approve consumers for a loan, the market for auto loans is more diverse and deals with more unfamiliar lenders, as borrowers generally do not have a close relation with a singular dealer. These dealers-as-lenders attempt to create the image that the dealership is working on behalf of borrowers to find them the best rate available from different lenders (Cohen, 2012). By convincing the borrowers that dealers are acting on their behalf, borrowers believe that they are receiving the

best available deal. From the dealer's standpoint there are two things that need to happen: originate the auto loan at the dealership and make the most profit possible. Dealers can get the most profit available if everything is completed in-house in order to make profit on both the sale and the mark-up. This is the point where the dealer fosters the idea of the "best rate." This best rate is perceived by consumers as the best rate for them, but in reality, it is the best rate for the dealer (Cohen, 2012). This is the problem with the asymmetric information in this market. The borrower only ever sees one summarized rate for the deal where the dealer receives multiple offers with a detailed breakdown of the rate, including the mark-up available. Ayres and Miller (1990) explore the effects that more knowledge of the quoted rate could have on consumers. Ayres and Miller (1990) proposes that since car markets are relatively "thin" and characterized by price dispersion, borrower knowledge of the mark-up would allow them to be more efficient consumers in determining the best deal. This knowledge would create competitive efficiency because it would lower bargaining times as well as generate more rational consumers.

This asymmetric information fosters two principal-agent relationships which both revolve around the dealer (Cohen, 2012). The first relationship is a classic principal-agent relationship between the buyer and the dealer (Cohen, 2012). Once a borrower has negotiated a deal for the car, they are generally sent to a finance and insurance manager (Cohen, 2012). This manager generally offers the borrower a chance to finance the car through them and collects their credit information. It is with the finance and insurance manager that negotiations over financing (mostly rates) take place and the manager adjusts the mark-up on the buy-rate to give the borrower the "best" deal. With the buyer getting the "best" deal from the dealer, the incentives for the dealer to make profit are obvious; the dealer can mark-up the loan for greater profit while still keeping a positive relationship. The second is a less obvious from the surface. As dealers get quoted rates and deals from lenders, they are acting as the agent to the lenders as well (Cohen, 2012). This is a competitive market as the goal of the lenders is for their deal to be accepted and to make profit from the deal. This means that on top of working a deal that is profitable for the lender, the deal must also be the best for the dealer as well. The mark-up rate that is instilled in many of the deals does not benefit the lender, as it allows for a higher risk of default, but as compensation to the dealer for bringing the business to them. So, even if a lender cannot provide the lowest risk-based buy-rate, mark-ups for the dealer can make their deal more appealing in comparison. This mark-up is a sort of "finding-fee" that the dealer is capable of generating by acting as the middleman in the deal (Cohen, 2012). In both cases of the principal-agent relationship, the dealer is capable of operating towards their own needs. Thus, as a whole, the market operates to the benefit of the dealer and inefficiently for both the lenders and borrowers.

C. Indirect Auto-Lending Guidance

The guidance released by the CFPB in March of 2013, *CFPB Bulletin 2013-02*, holds indirect lenders responsible for loans that are finalized at the dealership level. It claimed to be an extension of the ECOA such that it can be enforced more directly. The guidance explains its rationale in extending the enforcement of fair lending to indirect lenders by defining "creditor" more precisely since the ECOA defines a creditor as inclusive of "all persons participating in the credit decision"

(Consumer Financial Protection Bureau, 2013). This wide definition holds its importance in the guidance; standard practices reveal that indirect auto lenders fit the definition and are regularly involved in the decision (Consumer Financial Protection Bureau, 2013). Through the process of evaluating applicants' information, establishing a rate at which they would buy the obligation, and communicating that rate, an indirect lender establishes itself as a participant in the credit decision process (Consumer Financial Protection Bureau, 2013). The stretch in the definition of a creditor to hold indirect lender responsible received mixed reviews because of its reach and the fact that it is not dealing with direct to consumer finances (the final repeal vote in the Senate was 51-47).

As a creditor under the guidance's definition, the indirect auto lenders have certain responsibilities that must be upheld as a result of the ECOA. The ECOA explicitly states that it is, "unlawful for any creditor to discriminate against any applicant ... on the basis of race, color, religion, national origin, sex or marital status, or age" (Congress, 1974). The guidance more specifically targets these indirect auto lenders for one specific mechanism: the mark-up rates. The deals which generally contain mark-up rates are the base structure that introduces subjectivity into the process and makes the indirect lenders part of the final deal even if they do not decide the final rate. In the guidance, the CFPB states that "because of the incentives these policies create, and the discretion they permit, there is a significant risk that they will result in pricing disparities on the basis of race, national origin, and potentially other prohibited bases"(Consumer Financial Protection Bureau, 2013).

As a result of the policies and incentives that the indirect auto lenders can create, discrimination in the final rate that occurs as a result of mark-up allowance can hold the indirect auto lenders liable under the ECOA. There have been debates over the reach of this guidance because it is not the indirect lenders' choice for the final rate since the amount of mark-up is variable and the ECOA protects creditor's liability for another creditor's violation under some circumstances (Congress, 1974). However, since it is the indirect auto lender's own policy for mark-up and compensation policies, there is reasonable evidence that the policies constitute reasonable knowledge that price disparities may occur (Consumer Financial Protection Bureau, 2013).

Though this guidance places some burden on the indirect auto lenders, there are multiple solutions for lenders to remain compliant stated within the guidance itself. The first option that is theoretically no burden to the indirect auto lenders is to instate a flat-rate commission instead of the rate based associated with the mark-up to the rate (Consumer Financial Protection Bureau, 2013). This is no new idea; the Nissan Motors Acceptance Corporation (NMAC) attempted to implement this policy back in 1992 (Cohen, 2012). They had experienced that higher mark-up led to higher incidences of default on the loans and wanted to change that (Cohen, 2012). Though there was no push-back from consumers, dealers took their business elsewhere and NMAC suffered (Cohen, 2012). Since this was not a market change, competition beat it out, but in a whole market change the dealer has no way to avoid it. The second solution proposed was to monitor and analyze the mark-up policies and effects (Consumer Financial Protection Bureau, 2013). This places burden on the indirect auto lenders, but systematically allows the same style of transactions to occur in order to cause the least market disruption.

This guidance was repealed May 21, 2018 under the ruling that it "shall have no force or effect" (115th Congress, 2018). The decision to repeal the guidance was controversial due to the reach of the definition of a creditor by the CRA. The decision was such a reach for the CRA since it was presented as a guidance and not a rule that Congress had to validate it with the council of the U.S. Government Accountability Office (GAO) (, n.d.; Armstrong, 2017). The ruling was ultimately justified by previous cases such as *Pacific Gas & Electric Company v. Federal Power Commission* and ruling on a record of decision (ROD) issued by the Fish and Wildlife Service (Armstrong, 2017). These previous baseline cases allowed the guidance by the CFPB to be reviewed as a rule and fall under the CRA (Armstrong, 2017). The GAO explicitly stated that it was a rule which could be captured under the CRA because "the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy" fit to the guidance of the CFPB (Armstrong, 2017).

D. Measuring Discrimination in Lending

Several papers explore discrimination in the lending industry, including both mortgage and auto loans. The papers however, have not been conclusive, depending upon the experiment. Ayres (1991) runs a paired-audit study with a pair of consumers (i.e. white-male and black-female) who were trained under the same negotiation strategy and given similar backgrounds to a dealership to negotiate for a new car (Ayres, 1991). Ultimately, there was price discrimination after bargaining in this study; black-males were asked to pay over twice the white-male mark-up and black-females were asked to pay over three times the mark-up (Ayres, 1991). Also in the multivariate regression analysis, gender and race discrimination were statistically significant in all three of the models that were tested (Ayres, 1991). Though these results were promising at the local level of Chicago, the test is not at the national scale and it is not based on actual transactions. (Ayres and Siegelman, 1995), expand upon the previous study and data and expand upon the plausibility of different models of discrimination by viewing different variables as controls; though discrimination was evident, it was not determined to be any one theory of discrimination. In a study in response to the studies by Ayres (1991) and Ayres and Siegelman (1995), Goldberg (1996) uses the Consumer Expenditure Survey (CES) in order to gauge this from a national level while also gathering more information on the factors surrounding the purchase in order to control for more factors that could explain the differences between ethnicities. Factors surrounding the buyer's race and gender remained largely insignificant, but factors such as existing vehicle stock and financing method had significant effects within the regression results (Goldberg, 1996). However, this study has flaws as well; the most glaring problem is the availability of only household data, such that the race and gender of the bargaining/purchasing individual is unknown. Additionally, the possibility of measurement errors being responsible for the large standard errors on the race and gender parameters cannot be eliminated and leaves those results slightly inconclusive. (Goldberg, 1996).

Harless and Hoffer (2002) attempt to solve these problems by using the J.D. Power and Associates data set, such that it captures real transactions, identifies gender, and includes detailed information about the transaction such as the dealers' profits. This approach allows more descriptive data to be used to determine if discrimination is present by basing the results on the profit generated by

the dealer in the transaction as opposed to differences in the suggested retail value which was used by Goldberg (1996) (Harless and Hoffer, 2002). Under these parameters, Harless and Hoffer (2002) found no evidence of discrimination based on gender; however, they acknowledge the fact that if Ayres and Siegelman (1995) was correct in determining that black men were subject to a greater degree of discrimination than black women then the study by Harless and Hoffer (2002) could have results that were muted due to this finding. However, Harless and Hoffer (2002) does take it one step further and discovers sufficient evidence of price discrimination based on age-group. There is criticism about these studies for their mechanisms used to measure discrimination and their defining of the discriminated groups. Variability in their decisions parallels the variability of their results.

III. Economic Model

Individuals at dealerships may have a "taste for discrimination" if there is a difference in mark-up between different people systematically but not dependent on evidence related to risk. With the amount of subjectivity introduced by the structure of dealer mark-up, taste-based discrimination becomes a likely product. Since indirect lenders quote a buy-rate which is entirely objective to the borrower's credentials, there should be little variability between what offers lenders give to borrowers of similar credit backgrounds. However, with dealers' ability to barter the final deal within the constraints of the mark-up parameters, there is the possibility of the dealer having some reservation values for deals they will offer different borrowers. This is similar to the relationship that Becker (1971) explores for employers hiring different employees at different wages in the same way that lenders have reservations about who they may want to lend to.

The dealer is essentially forgoing profits for those who he does not raise the mark-up when the mark-ups are only raised for some; the actual forgoing of profits is the distinction that sets the act as actual discrimination (Becker, 1971). The forgone profit is measured by the actual difference in dealership profits, traditionally, but in viewing this indirect lending market, this paper will focus on differences in APR in transactions since that is the source of the dealer mark-up (Ayres and Miller, 1990; Goldberg, 1996). Differences in APR from the dealer remains as an independent item, since the buy-rate is decidedly the credit risk that a borrower imposes, with variables related to creditworthiness held constant. The overall profit is ultimately affected by forgoing larger mark-ups on different borrowers.

This model of "taste-based discrimination" by Becker (1971) defines a forgoing of profit, but that is not inherently true in this market. Legally, discrimination does not need to be uneconomic and forgo profits to exercise prejudice against a group (Ladd, 1998). The buy-rate sets a standard profit, and the mark-up provides additional profit based on what the market will bear (Cohen, 2012). The differentiation in mark-ups would be minimized with competition because borrowers could easily differentiate a 'good deal'; however, the lack of information gained in getting a rate quoted by a dealer is minimal, time costs are high in getting a quote, and the purchasing and financing of a car is not a relatively frequent event, so intense competition is not prevalent. Ayres and Miller (1990) explores the idea that if there was more transparency in the mark-up, competition of mark-ups would occur, and price dispersion of final offers would decrease. In lieu

of this extreme amount of transparency that not every customer would have complete understanding of, the measure of holding both dealers and indirect lenders responsible for price dispersion should theoretically take similar effect as they must be transparent about mark-up to auditors. Thus, dealer discrimination in loans would be the artificial force driving the market to act more competitively.

There are other theories which also explain the possible sources of discrimination in the auto loan market, even though taste-based discrimination is a likely factor contributing to discrimination in the auto loan market. Price discrimination is another possibility within the auto loan market; dealers are personally meeting with the borrowers and are able to make inferences about them based on physical characteristics, and they are also able to test their assumptions through the process of negotiation. Ayres and Siegelman (1995) states that ancillary evidence that the disparate treatment may be a result of statistical inference of the reservation prices by the different groups. With the statistical inference about these groups, presumably, the groups with the higher reservation price will receive lower mark-ups because negotiations for the loans would start lower. However, negotiations would generally allow more room for mark-up *ceteris paribus* if minority groups have lower reservation prices. This was supported by Ayres and Siegelman (1995) in finding that black males received the highest initial offers for negotiations.

Inferences into elasticity may play a role in the discrimination as well. If minorities are presumed to have more inelastic demands, the higher starting negotiations for minorities follows the logic. However, additional results support the belief in inelastic demand as Ayres and Siegelman (1995) found that black males were also on average able to lower their initial offer by the greatest percent. These inferences would lead to third degree price discrimination in which group inferences are the driving force. However, the possibility of first-degree price discrimination cannot be ruled out due to the nature of the process of getting car loans. Cohen (2012) refers to dealers marking up loans to what the market will bear. There is the ability to determine exactly what each borrower is willing to accept with finance managers conducting negotiations on an individual basis. This theory of first-degree price discrimination supports the idea that dealers act as profit maximizers by reducing the consumer surplus to zero.

Additionally, statistical discrimination is a byproduct of the theory of third-degree price discrimination. The dealer doesn't necessarily know the reservation prices of the different borrowers, but they could possibly infer the reservation price based on physical characteristics. With as many variables held constant as possible, including negotiation strategy, Ayres and Siegelman (1995) results revealed that African American men had higher initial offers; however, after the same negotiation strategy were able to lower it by a larger percentage on average. This is indicative of inferring different demand elasticity between groups with the African American males having the more inelastic demand.

Overall, the three theories of discrimination that are possibly occurring represent a common story. Dealers have all the majority of the power when negotiating the deals. Time costs to achieve the necessary information are very high and dealers can conceal the real information. There are multiple avenues in which dealers can be successful in achieving discrimination between groups.

So, no matter which way the dealers are attempting to identify ways to discriminate, they can find a way to turn the deal to their favor and achieve the highest mark-ups they want if they remain unchecked.

IV. Data

This paper utilizes data from the Survey of Consumer Finances (SCF) over three survey years: 2010, 2013, and 2016. The wide range of years provides enough data for before and after the placement of the guidance to see an effect. This survey is comprehensive of household finances and contains information on finances, assets, and demographics (for a listing of variables gathered see Table 2). There are few other data sets that are as comprehensive in the questions asked the SCF. However, there are some biases present in the composition of survey. The survey only interviews approximately 6,500 families and participation is strictly voluntary; additionally, since the selection is random, replacement of the selected families with similar families cannot occur in order to maintain validity of the survey. Therefore, if there are families who decline to participate, families similar to theirs may not be as clearly represented. There appears to be a significant bias in the number of white non-Hispanic representation, but as a national survey it is representative of the true population percentages. Additionally, there is a lower representation of responses by women in the data set due to the notion that the head of the household in America is traditionally considered the male.

As the data set contains some confidential and sensitive information, it is not made publicly available in its raw form. Some information such as geographic information is omitted from the public data set for privacy reasons. It is stored as multiply imputed
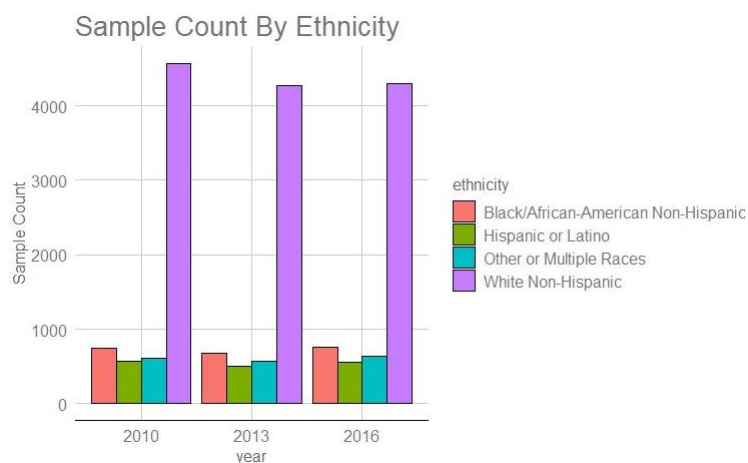

Figure 2. Sample Counts By Ethnicity By Year

data and separate replicate weight files. The multiple imputations are stored as a series of five tables with each row representing a household. The five tables provide successive replicates of each household to account for the statistical uncertainty that is present. To ensure accuracy, the use of both the sample weights in the imputations and the replicate weights ensures as much accuracy as possible. However, there is margin of error associated with each calculation because the data is meant to be representative of the nation. Since the standard error calculations can overestimate the reliability of the results, accounting for both imputation error and sample variability error minimizes this risk.

The primary dependent variable gathered for analysis from the SCF is the Annual Percentage Rate (APR) for the primary car loan. This paper aims to determine if discrimination is occurring within APRs because the guidance specifically targets mark-up (see Figure 3). Initial views of these distributions reveal clear differences for APRs between different ethnicities, but they are not inclusive of differences between the different groups. Through the inclusion of factors that can reveal differences, this paper provides a more accurate view of the distribution differences of the APRs. Most papers aim to analyze overall profit generation, but the guidance has no hold over the overall profit (Goldberg, 1996; Ayres, 1991). There is an assumption made for the analysis that in the process of the survey, the main respondent who reported their gender and race/ethnicity reports the primary car as their own and not a family member's. This is based on the questions in the survey stating that the statements for car #1 refers to the first personally owned car.

For the purposes of this analysis, a subset of the data was used such that only people who reported having a car loan with an APR were used. This lowers our observations to approximately 2,080 in total, but still provide enough observations for accuracy (see Table 1).
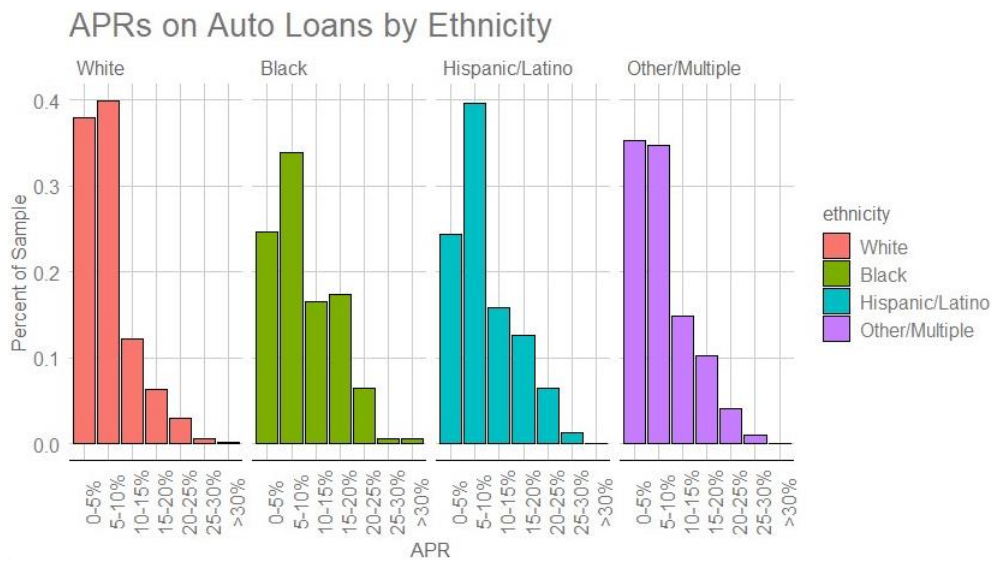

Figure 3. Histogram Of APR Distribution Divided By Ethnicity

V. Empirical Strategy

This paper utilizes Oaxaca-Blinder decomposition in order to estimate the levels of discrimination before and after the guidance by the CFPB, Consumer Financial Protection Bureau (2013), was put in place in order to determine the effects that the guidance had on the level of discrimination evident in the auto loan market. The two-fold method is used in order to determine the unexplained differences in APRs that different people receive while controlling for other factors that are predictors of APR. The two-fold decomposition is as follows:

(1) $$\Delta \bar{Y} = (\bar{X_W} - \bar{X_M})' \hat{\beta}_R + \bar{X_W}'(\hat{\beta}_W - \hat{\beta}_R) + \bar{X_M}'(\hat{\beta}_R - \hat{\beta}_M)$$

In this case X_M is representative of a vector of variables relating to creditworthiness and demographics for minorities and X_W represents the same vector of variables for white non-Hispanic. The $\hat{\beta}_R$ represents the set of reference coefficients which in this case is $\hat{\beta}_W$ since we are under the assumption that only the minorities face discrimination. The dependent variable, $\Delta \bar{Y}$ is representative of the mean difference in the APR for the two groups. The equation can be broken down into three sections. The first term is representative of the amount of difference explained be group differences in explanatory variables. The second term represents the portion of the mean differences in APR that is unexplained for white non-Hispanics, and the third term represents the unexplained APR difference for minorities. Thus, the combination of the second and third sections are representative of what is unexplained by the explanatory variables. Only one of the last two terms is represented in each test so the model remains truly two-fold. Basing of our reference coefficients on those produced by the white non-Hispanic group reveals the portion of unexplained differences represents only the unexplained differences from non-minority's perspective. Basing the reference coefficients on the minority group will represent the unexplained differences from the minority's perspective. Results should remain similar, but slightly different and reveal a fuller picture of where the differences are originating from. Assuming that the vector of explanatory variables is effective at representing the key pieces of information that could have an effect on the APR of an auto loan, the portion of unexplained differences will reveal the subjectivity built into the mark-up system for the loans while the explained differences represents the difference in buy-rates based on differences in factors of the two groups. We expect to see the difference between the portions of unexplained differences shrink over time with the introduction of the guidance by the CFPB holding indirect auto lenders responsible for discrimination in mark-up.

The underlying assumption for our strategy is that indirect lenders operate under the same amount of limited information similar to what we are able to obtain. Indirect lenders are only given credit data provided by the dealership. As a result, when controlling for similar factors, the decomposition generates a rate similar to the buy-rate that would be generated by the indirect lenders.

The decomposition is also commonly subject to omitted baseline category issues for categorical variables (Oaxaca and Ransom, 1973). The issue is generated by the user's choice of which group to omit in order to prevent perfect multicollinearity. This is addressed in the tests through the use of a procedure proposed by Gardeazabal and Ugidos (2004). The coefficients of the regression

related to the categorical variables are adjusted by an amount *a*, where *a* is generated based on the number of categories *k*:

$$a = \frac{\sum_{j=1}^{k-1} \beta_j}{k}$$

(2)

Since the data is stored in separate imputations that are unable to be run simultaneously, Rubin's rule is used to find the average values based on the five imputations (Rubin and Schenker, 1986). The rule holds because all imputations are supposed to be representative of the same population and homogeneous as well. Using Rubin's rule, the true average for an imputed data set should be the average of the results of the five imputations.

$$\bar{Q} = 1/m \sum_{i=1}^{m} \hat{Q}_i$$

(3)

The rule allows us to summarize the results that were spread over the five imputations to come to a decisive conclusion on the actual effect. Tests will also be run with the reference group set to both whites and minorities in order to check the robustness of the results.

VI. Results

Oaxaca-Blinder decomposition test results were counter-intuitive to the expected results of the guidance's effects (See Table 1). In Table 1 the overall difference can be seen in the top row of the table; Explained differences are reported in the top section with the variables listed below it and the unexplained differences can be seen in the bottom section with the same variables reported. The columns are labeled such that the odd-numbered columns are representative of discrimination based on the coefficients generated by the white group, and the even-numbered columns based on the minority group. These even and odd columns are paired such that in each of the three tests run, there is one based on the group who obtained an auto loan prior to the guidance being put in place, and one based on the group who obtained an auto loan after the guidance was in place. Over the three tests, more factors possibly relating to APR on a loan are included. This assists with the possibility of omitted variable bias skewing the portion of the difference that is unexplained. The second test proceeds to include their income and net worth, while the third test includes spending habits as well as their employment status. Since the test is structured such that non-minority is base group for the difference, negative values indicate minority groups have an APR that percentage higher. For example, a value of -2.2086 reveals that, if the average APR for non-minorities was 1% for that factor, the average APR for the minority group would be 3.3086%.

TABLE 1—OAXACA-BLINDER DECOMPOSITION ON MINORITY DIFFERENCES IN APR OF AUTO LOANS

	Pre-Guidance		Post-Guidance		Pre-Guidance		Post-Guidance		Pre-Guidance		Post-Guidance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OB-W	OB-M	OB-W	OB-M	OB-W	OB-M	OB-W	OB-M	OB-W	OB-M	OB-W	OB-M
Overall APR Gap on Auto Loans	-2.2086	-2.2086	-2.6884	-2.6884	-2.2086	-2.2086	-2.6884	-2.6884	-2.2086	-2.2086	-2.6884	-2.6884
Explained Difference	-0.8139	-0.6333	-0.5087	-0.3227	-0.8951	-1.3226	-0.7371	-0.8901	-0.9456	-1.467	-0.7817	-0.8727
credit shopping ammt (great)	0.0108	0.0579	-0.0106	-0.034	0.01	0.0546	-0.0089	-0.0274	0.0078	0.0553	-0.008	-0.0267
credit shopping ammt (moderate)	-0.034	-0.2208	-0.021	-0.0183	-0.0298	-0.2092	-0.0149	-0.0145	-0.0185	-0.2065	-0.0135	-0.0126
have payday loan	-0.1378	-0.0267	-0.0864	-0.064	-0.1321	-0.0244	-0.0798	-0.0558	-0.1323	-0.0239	-0.0776	-0.0594
late payment	-0.2927	-0.2004	-0.2123	-0.0927	-0.2726	-0.1647	-0.1724	-0.0621	-0.2809	-0.1527	-0.1689	-0.079
late payment over 60 days	-0.2432	0.0929	-0.1373	-0.0167	-0.2422	0.0927	-0.142	-0.0195	-0.2274	0.0912	-0.1407	-0.0141
loan length car years	-0.1172	-0.3361	-0.0411	-0.0971	-0.119	-0.3234	-0.0472	-0.0719	-0.1172	-0.3277	-0.0432	-0.0803
income					-0.0901	-0.5373	-0.2235	-0.6807	-0.0844	-0.6022	-0.2275	-0.6682
networth					-0.0193	-0.211	-0.0483	0.0419	-0.0201	-0.187	-0.0264	0.0507
spend less if asset depreciates (somewhat agree)									0.0001	0.0011	-0.0157	-0.0003
spend less if asset depreciates (neither agree nor disagree)									0.0053	-0.0328	0.001	0.0112
spend less if asset depreciates (somewhat disagree)									-0.0095	-0.1041	-0.0258	0.0359
spend less if asset depreciates (strongly disagree)									-0.0215	0.0106	-0.0061	0.0072
work status (other groups not working)									-0.0535	0.0286	-0.0091	-0.021
work status (retired/disabled)									-0.0049	0.0065	0.0000	0.0039
work status (self-employed/partnership)									0.0112	-0.0233	-0.0201	-0.0199
Unexplained Difference	-1.3947	-1.5753	-2.1797	-2.3656	-1.3135	-0.886	-1.9513	-1.7983	-1.263	-0.7416	-1.9067	-1.8157
credit shopping ammt (great)	1.3756	1.3286	0.4667	0.4901	1.3107	1.2661	0.3522	0.3707	1.3905	1.343	0.3432	0.3618
credit shopping ammt (moderate)	2.1112	2.2981	-0.0731	-0.0758	2.028	2.2074	-0.0076	-0.008	2.1244	2.3124	-0.025	-0.026
have payday loan	0.1999	0.0888	0.0857	0.0634	0.1937	0.0861	0.0921	0.068	0.195	0.0867	0.0678	0.0497
late payment	0.2386	0.1463	0.2889	0.1693	0.279	0.1711	0.2665	0.1562	0.3317	0.2035	0.2174	0.1275
late payment over 60 days	0.6842	0.3482	0.314	0.1934	0.682	0.347	0.3188	0.1962	0.6485	0.3299	0.3298	0.2031
loanlengthyear_car	5.1184	5.3373	1.3134	1.3694	4.7855	4.9898	0.5901	0.6148	4.9307	5.1413	0.8808	0.9179
income					0.8053	1.2524	0.9324	1.3897	0.9324	1.4502	0.895	1.3358
networth					0.104	0.2957	-0.0468	-0.1371	0.091	0.2579	-0.0402	-0.1173
spend less if asset depreciates (agree somewhat)									0.1372	0.1362	-0.2184	-0.2338
spend less if asset depreciates (neither agree nor disagree)									0.1388	0.1769	-0.0426	-0.0528
spend less if asset depreciates (disagree somewhat)									0.1954	0.29	-0.2077	-0.2694
spend less if asset depreciates (strongly disagree)									0.1666	0.1346	-0.1292	-0.1425
work status (other groups not working)									0.2042	0.1222	-0.0726	-0.0608
work status (retired/disabled)									0.2375	0.2261	-0.0347	-0.0386
work status (self-employed/partnership)									0.0405	0.0751	-0.0004	-0.0005
Constant	-11.1227	-11.1227	-4.5753	-4.5753	-11.5017	-11.5017	-4.4488	-4.4488	-13.0274	-13.0274	-3.8698	-3.8698

Note: OB-W represents the Oaxaca-Blinder decomposition with $\beta_R = \beta_{White}$ and OB-M represents the Oaxaca-Blinder decomposition with $\beta_R = \beta_{Minority}$.
*See Table 2 for a description of all variables used.

Overall differences in APR for minorities appears to have increased after the guidance was put in place by the CFPB. If increased differences were a result of differences between the credibility and financial knowledge of different borrowers, increases in explained differences would result and the difference would not be a byproduct of discrimination. Decreases in explained differences would not be a byproduct of the guidance because it is not capable of regulating general negotiation strategies of dealers or risk-based rates determined by indirect lenders. Conversely, increased differences appear to be a result of unexplained differences, while explained differences appear to have decreased. These unexplained differences are what describes differences caused by subjectivity but not actual differences between groups.

Overall differences in APR between pre and post-guidance appears to have increased [3] by approximately 0.48%, so the gap has increased between these two periods (See Table 1). Though this seems like a small difference, it reveals an approximately 22% increase from the period prior to the guidance. Conversely, the gap appears to have decreased for differences as a result of differences in factors related to creditworthiness and bargaining. It is a positive note that there is a decrease showing in this gap, but the increase in the unexplained difference is to a larger magnitude which contributes to the overall increase in differences. In decomposition (1) and (3), while explained differences decreased by approximately 0.31%, unexplained differences increased by approximately 0.78% which more than doubled the decrease. This trend continues throughout each regression comparison. With this trend in place it is difficult to say that the guidance was effective in decreasing the unexplained differences in auto loan rates which would be indicative of discriminatory practices.

VII.   Conclusion

Results reveal the ineffectiveness of the auto-loan guidance to reduce discriminatory lending practices through regulation of mark-ups. The goal of driving the market to be more competitive and reduce unnecessary discrimination does not appear to have the intended effects due to the large increases in unexplained differences in the post-guidance period. It is possible that several forces may have had an impact on this: strong market forces, failure to make adjustments, or general lack of compliance. Strong market forces have precedence in undermining proactive measures to reduce the possibility of discrimination, such as the Nissan Motors Acceptance Corporation's Consumer First Financing program that implemented flat-rate compensation and caused a significant loss in business (Cohen, 2012). The competitive nature of the indirect lenders could make mark-ups a necessity for firms to maintain business volume even though they realize it is not as responsible a practice as it could be. Failure to make adjustments is possible because of the costs associated to the firms. One solution posed by the CFPB is to implement a compliance management system (CMS) (McDonald and Rojc, 2014). There are four components that the CFPB defines as key to a successful CMS: "Board and management oversight; Compliance program; Response to consumer complaints; and Compliance audit" (McDonald and Rojc, 2014). This system would rely on cooperation from dealers to provide the necessary information and time and resources from the lenders in order to implement it. General lack of compliance may also occur for many other various reasons, but the overall effect is a continuation of previous practices.

The actual increase in the levels of unexplained differences could possibly be linked to consumer's comfort levels or increasingly polarized views. Consumers may not have recognized the decreasing gap between creditworthiness due to the asymmetric information provided. Minority groups may have become comfortable with the gap that had been present before. So, only a small gap increase was realized while dealers were able to achieve higher mark-up. Additionally, since the mark-ups are subjective at the individual level, if the constraints were not effective, individuals may have overall seen an increased polarity and been able to pursue it.

The overall failure of the CPFB guidance to produce any overall decrease in subjective differences between APR rates between minority and non-minority groups provides basis for the repeal under 115th Congress (2018). With the Congressional Review Act (n.d.), nothing similar in nature may be implemented by the CFPB in the future, but, since the guidance proved ineffective, this is not of large concern. There have been several other solutions to this ongoing problem of discriminatory lending in the auto industry (Fairlie, 2017; Peterson, 2018; Ayres and Miller, 1990). Ayres and Miller (1990) looks to lessen the gap through mark-up disclosure.

If all consumers were given information about seller's cost, there would probably be a smaller dispersion of retail sale prices in bargaining markets. Uniformly knowledgeable buyers would bargain to more uniform prices than buyers with different degrees of information about the seller's mark-up. The primary distributional consequence of mark-up disclosure would thus be a more uniform sales price. (Ayres and Miller, 1990)

This solution works directly with the theory of third-degree price discrimination. If one group was overall less knowledgeable of "good" rates, they would likely have a more inelastic demand. However, through mark-up disclosure, borrowers would be more knowledgeable of quality deals and in turn have more elastic demands since they would have the knowledge equivalent to multiple offers; this new knowledge would cause APRs to converge to a more uniform rate.

Another solution to lowering discrimination from mark-up would be a flat-fee commission (Rice and Schwartz, 2018); however, the failure of the Consumer First Financing program by NMAC revealed a large disincentive to first movers attempting to disrupt the market process. While a natural movement of responsible lending would be optimal to achieve this change, the first-mover disincentive appears strong. Fear of loss of business similar to the NMAC is driving other firms away from this solution. The guidance by the CFPB attempted to remove subjectivity while it still remained a factor in the process since markups were allowed as long as they were non-discriminatory. This solution would effectively remove all subjectivity from the process, but it would still be necessary for external force and policy intervention to achieve this.

Even though the guidance by the CFPB did not appear to effectively lower discrimination in the auto lending industry, it was a step in the right direction. As seen in Table 1, the level of discrimination appears to have increased since 2013, so it is more of a problem than when the guidance attempted to correct it. Many agencies and sources such as the CFPB attempt to continually inform borrowers with advice on how to get good deals on their loans and improve financial literacy, but this information can only be effective to a point. Time constraints remain a

factor while more time means more information and generally a better idea of "good" deals in the auto loan market. For consumers under these constraints, they may still fall subject to discrimination due to a lack of knowledge. The guidance was a proactive step to attempt to help consumers by holding the lenders more responsible for their actions, and, with the strong influence of the dealers over both the borrowers and lenders, natural changes appear unlikely.

VIII. References

115th Congress. 2018. *Public Law 115–172*. Vol. 164. Washington, United States of America: Congress.

Armstrong, Thomas H. 2017. "GAO CFPB RESPONSE." *Congressional Record - Senate*. Washington.

Atta-Krah, Kwesi. 2016. "Preventing a Boom from Turning Bust: Regulators Should Turn Their Attention to Starter Interrupt Devices Before the Subprime Auto Lending Bubble Bursts." *IOWA LAW REVIEW*. Vol. 101. https://www.lendingtree.com/glossary/what-is-subprime-borrower.

Ayres, Ian. 1991. "Fair Driving: Gender and Race Discrimination in Retail Car Negotiations." *Harvard Law Review* 104 (4): 817–72. https://doi.org/10.2307/1341506.

Ayres, Ian, and F Clayton Miller. 1990. "'I'll Sell It to You at Cost': Legal Methods to Promote Retail Markup Disclosure." *Northwestern University Law Review* 84: 1047. http://heinonline.org/HOL/Page?handle=hein.journals/illlr84&id=1063&div=&collection=journals.

Ayres, Ian, and Peter Siegelman. 1995. "Race and Gender Discrimination in Bargaining for a New Car." *American Economic Review* 85 (3): 304–21.

Becker, Gary S. 1971. *The Economics Of Discrimination*. Edited by Milton Friedman. Second. Chicago: The University of Chicago Press.

Cohen, Mark A. 2012. "Imperfect Competition in Auto Lending: Subjective Markup, Racial Disparity, and Class Action Litigation." *Review of Law and Economics*. https://doi.org/10.1515/1555-5879.1501.

Congress. 1968. "Fair Housing Act."

Congress. 1974. *Equal Credit Opportunity Act*. Congress.

Congressional Review Act (5 U.S.C. Chapter 8) § 801. n.d. United States of America.

Consumer Financial Protection Bureau. 2013. *CFPB Bulletin 2013-02*. CFPB.

Fairlie, Robert W. 2017. "Addressing Path Dependence and Incorporating Sample Weights in the Nonlinear Blinder-Oaxaca Decomposition Technique for Logit, Probit and Other Nonlinear Models." *Stanford Institute for Economic Policy Research Discussion Paper* 17 (13): 1–26. Gardeazabal, J, and A Ugidos. 2004. "More on Identification in Detailed Wage Decompositions." *Review of Economics and Statistics* 86 (4): 1034–36.

Goldberg, Pinelopi Koujianou. 1996. "Dealer Price Discrimination in New Car Purchases : Evidence from the Consumer Expenditure Survey." *Journal of Political Economy* 104 (3): 622–54.

Guasch, J. Luis, and Andrew Weiss. 1980. "Wages as Sorting Mechanisms in Competitive Markets with Asymmetric Information: A Theory of Testing." *The Review of Economic Studies* 47 (4): 653–64. https://doi.org/10.2307/2296934.

Harless, David W, and George E Hoffer. 2002. "Do Women Pay More for New Vehicles ? Evidence from Transaction Price Data." *American Economic Review* 92 (1): 270–79.

Harris, Milton, and Robert M Townsend. 1981. "Resource Allocation Under Asymmetric Information." *Econometrica* 49 (1): 33–64.

Holt, Jeff. 2009. "A Summary of the Primary Causes of the Housing Bubble and the Resulting Credit Crisis." *The Journal of Business Inquiry* 8 (1): 120–29.

Ladd, Helen F. 1998. "Evidence on Discrimination in Mortgage Lending." *Journal of Economic Perspectives* 12 (2): 41–62. https://doi.org/10.1257/jep.12.2.41.

McDonald, Kevin M, and Kenneth J Rojc. 2014. "Automotive Finance: Shifting Into Regulatory Overdrive." *Business Lawyer* 69 (2): 599–607.

Oaxaca, R. L., and M. R. Ransom. 1973. "Identification in Detailed Wage Decompositions." *Review of Economics and Statistics* 81 (1): 154–57.

Peterson, Christopher L. 2018. "Auto Dealer Markups, Jim Crow Finance, and the Congressional Review Act : How Congress May Bend the Rules to Facilitate Overpriced and Discriminatory Auto Lending."

Peterson, Christopher Lewis. 2016. "Consumer Financial Protection Bureau Law Enforcement: An Empirical Review." *Tulane Law Review* 90 (5): 1057–1112. https://papers.ssrn.com/abstract=2780791.

Peterson, Richard L. 1981. "An Investigation of Sex Discrimination in Commercial Banks' Direct Consumer Lending." *The Bell Journal of Economics* 12 (2): 547–61.

Rice, Lisa, and Erich Schwartz. 2018. "Discrimination When Buying A Car : How The Color Of Your Skin Can Affect Your Car-Shopping Experience." Washington DC.

Rubin, Donald B., and Nathaniel Schenker. 1986. "Multiple Imputation for Interval Estimation from Simple Random Samples with Ignorable Nonresponse." *Journal of the American Statistical Association* 81 (394): 366–74. https://doi.org/10.1080/01621459.1986.10478280.

Seide, Christopher K. 2012. "Consumer Financial Protection Post Dodd-Frank: Solutions To Protect Consumers Against Wrongful Forclosure Practices And Predatory Subprime Auto Lending." *U.R.P Business Law Journal* 3 (2): 219–54.

Shaffer, Sherrill. 1996. "Evidence of Discrimination in Lending: An Extension." *The Journal of Finance*. Vol. 51.

IX. Appendix

Table 2—Distribution of Race/Ethnicity for Pre/Post-Guidance

Sample Counts

	Pre-Guidance	Post-Guidance
White Non-Hispanic	955.2	390.8
	(3.04)	(1.96)
Black/African-American Non-Hispanic	229	111
	(1.73)	(1.55)
Hispanic or Latino	142.2	61.8
	(1.8)	(0.49)
Other or Multiple Races	122	68.6
	(0)	(1.47)

*Standard errors reported in parentheses below results

Table 3—: Variables Reference List

Variable	Description
year	Year the Survey was taken
education level	Level of education obtained: less than high school, high school or GED, some college, college degree
gender	Sex of the survey respondent
age	Age of the respondent
married	Whether or not the respondent is married
kids	Number of children
life cycle	Life cycle stage of the household: head under 55, not married, no kids; head under 55, married, no kids; head under 55, married, kids; head under 55, not married, kids; head over 54, working; head over 54, not working
net worth	Total assets minus debts
Variable	Description
work status	Employment type: working for someone else, self-employed/partnership, retired/disabled, other groups not working
income	Total household income in previous calendar year
wages saved	Whether or not the household spent more than earned adjusting for purchase of durable goods and investments
spend more if asset appreciates	respondent would spend more if assets appreciated in value (1=agree strongly, 2=agree somewhat, 3=neither agree nor disagree, 4=disagree somewhat, 5=disagree strongly)
spend less if asset depreciates	respondent would spend less if assets depreciated in value (1=agree strongly, 2=agree somewhat, 3=neither agree nor disagree, 4=disagree somewhat, 5=disagree strongly)
late payment	Household had any late payments in the past year
late payment over 60 days	Household had any late payments in the past year over 60 days
payday loan	Someone in the household has a payday loan
credit shopping ammt (none)	When making major decisions about borrowing money or obtaining credit, respondent does little to no searching for the best terms
credit shopping ammt (great)	When making major decisions about borrowing money or obtaining credit, respondent does a great deal of searching for the best terms

credit shopping ammt (moderate)	When making major decisions about borrowing money or obtaining credit, respondent does a moderate amount of searching for the best terms
checking	Household checking accounts other than money market
has check	Household has checking account
saving	Household savings accounts
has saving	Household has savings account
vehicle value	Combined value of vehicles
has vehicle	Household has a vehicle
vehicle own	Household owns vehicles (excludes motorcycles, RVs, motor homes, tractors, snow blowers etc)
vehicle own number	Number of vehicles the household owns (excludes motorcycles, RVs, motor homes, tractors, snow blowers etc)

Variable	Description
vehicle installment	Value of vehicle installment loans
has vehicle installment	Has a vehicle installment loan
race/ethnicity	Respondent's race/ethnicity: white non-Hispanic, black/African-American non-Hispanic, Hispanic or Latino, Other or Multiple Races
minority	Respondent's minority status: white non-Hispanic, nonwhite or Hispanic
retirement	Quasi-liquid retirement accounts (IRAs and thrift-type accounts)
new car	Respondent bought car new
bought year car	Year the car was bought
loan owed car	Whether money is still owed on the car loan or not
borrowed amount car	Amount the loan was borrowed at
regular loan car	Whether the auto loan is a regular installment loan where the respondent pays a fixed dollar amount each month for a fixed number of months until the loan is repaid
loan length car years	Length of the auto loan in years
payments car	Number of payments on the auto loan

X. Notes

[1] The Consumer First Financing Program was enacted by the Nissan Motors Acceptance Corporation (NMAC), an captive auto lender with Nissan dealers which is part of the indirect auto loan process, in 1992. This was in a reaction to higher mark-ups leading to greater instances of defaults and expenses. This program was designed as a flat-rate pricing program; compensation was based on yield-spread. This program failed due to the Nissan dealer body rejecting the program, and, as a result, caused immediate and significant losses to the NMAC.

[2] The Consumer First Financing Program was enacted by the Nissan Motors Acceptance Corporation (NMAC) in 1992. This was in a reaction to higher mark-ups leading to greater instances of defaults and expenses. This program was designed as a flat-rate pricing program; compensation was based on yield-spread. This program failed due to the Nissan dealer body rejecting the program, and, as a result, caused immediate and significant losses to the NMAC.

[3] Results of negative value denote increases for minorities as differences are calculated $\Delta \bar{Y} = \bar{Y}_{White} - \bar{Y}_{Minority}$