

Prejudice in Discretionary Market Transactions

The Case of Markup Disparity in Indirect Auto Lending

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*Note: this project is the result of the author's independent research and does not necessarily represent the views of the Consumer Financial Protection Bureau or the United States.

What Does This Paper Do?

- Conducts tests of “standard” models of taste-based and statistical discrimination using data from an actual market.
- Explores the interesting and important (and under-explored?) market for indirect auto loans using “new” data set with more comprehensive measures than were previously available.
- Shows that patterns of disparities in discretionary “dealer markup” are consistent with specific predictions of a Becker-style model of discrimination.
- Shows evidence that statistical discrimination based on observable signals does not appear contribute to disparities.
- Shows suggestive evidence that is inconsistent with search playing a role in the observed disparities.

Important caveats

- This is a “paper by proxy.”
 - The identification relies on proxies for race, prejudice, and signals/information.
 - While I believe each proxy is statistically/conceptually valid, if you don't buy them, you don't have to buy the results.
- This project is still developing; the results I can report are preliminary and subject to change as more data become available.
 - Still refining and validating the measures of prejudice from the GSS.
 - Many additional observations from supervisory auto data will be available soon.
 - Results are subject to change as these additional data are incorporated into the analysis.

Motivation: Lots of studies of discrimination, few link evidence to a specific theory

- Theories of discrimination need to explain *how/why* discrimination may pop up in a market.
 - Most models rely on some type of market failure.
 - Persistence of the market failure can be difficult to rationalize.
- Empirical studies of discrimination try to show *that* discrimination is present in the market.
 - Often assume or hand-wave at a theoretical source.
 - Disconnect from theory makes policy prescription difficult/rare.
- Very few empirical tests of discrimination.
 - Different models can lead to different optimal antidiscrimination policies.

Motivation: Market for indirect auto loans is important, interesting, and under-explored.

- Autos are often one of the largest purchases in a consumer's life.
 - Transaction repeated more than other large purchases, so "collective" importance is even higher.
- Most auto purchases are financed with indirect loans.
 - Loans are large enough to substantially impact financial well-being.
 - Different treatment could contribute to gaps beyond just the market for auto loans.
- Despite this, the economics literature hasn't focused much on this market.

Related literature: theories and evidence of discrimination

- As a generalization, theories fall into three general camps:
 - Taste-based theories (e.g. Becker, 1957).
 - Statistical theories (e.g. Aigner and Cain, 1972; Arrow, 1973).
 - “Other” theories (e.g. Black, 1995; Lang et al., 2005).
 - (First two are much more commonly referenced.)
- There are a LOT of empirical studies of discrimination, mostly in the labor literature.
 - Too many to summarize; Neal and Johnson (1996) and Lang and Manove (2011) provide interesting reads and possible bounds.
- There are very few empirical tests of the theories, including:
 - Game show papers (odd structures, not true markets)
 - Sports papers (idiosyncratic markets)
 - Importantly: Charles and Guryan, 2008, which this paper follows closely.

What is markup?

- After all the negotiation over the vehicle and price have occurred, dealers can earn additional money by adding “markup” to a customer’s interest rate.
 - Dealer shops the buyer’s application to multiple(?) lenders.
 - Dealer decides on lender, and whether and how much to mark the buy rate up (up to 250 basis points).
 - Dealer receives compensation from the lender in the form of a flat fee, and/or a share of the markup.*
- Markup is completely discretionary, and customers have little to no knowledge of it.
 - Customers do not observe their buy rates, or the markup (< 30% even claim to know markup can occur).

General Social Survey data

- Biennial survey, lots of questions
- At least 24 questions related to racial prejudice asked at various times over the life of the survey
 - e.g. “How strongly would you object if a member of your family wanted to bring a [black] friend home to dinner?”
- “Core” index relies on four questions asked in every wave:
 - e.g. “If your party nominated a Black [person] for President, would you vote for him(!) if he were qualified for the job?”
- Focus will be on the core index, as it has statistical advantages.

Supervisory auto data

- Administrative data collected from financial institutions as part of the CFPB's supervisory responsibilities
 - Comprises 7M+ observations of loans originated between 2008-13.
 - Contains all information used by lender to underwrite and price loans (e.g. vehicle info, credit history, FICO, etc.).
- These data show the risk-based “buy rate” (the rate at which the lender is willing to extend the loan) and the markup added by the dealer.
- More comprehensive and accurate data than have ever been used to explore this market, BUT missing race/ethnicity.
“Solution”: BISG.

Summary statistics for loan characteristics in the supervisory auto data

Measure	Black	White
Marked Up	0.740 (0.44)	0.704 (0.46)
Markup Amt.	1.21 (0.90)	1.07 (0.90)
FICO	705.5 (70.7)	740.5 (71.2)
Buy Rate	6.91 (5.46)	4.68 (3.71)

What relationships are being tested/what exactly are we looking for?

- Does negotiation skill impact (decrease) markup?
 - Look for relationship between price paid for car and markup
- Are the predictions of taste-based models (that marginal, not average prejudice matter) accurate?
 - Look for positive coefficients on marginal prejudice; zero coefficients on average prejudice
- Are there different returns to signals of financial sophistication (consistent w/statistical discrimination)?
 - Look for positive coefficients on the interaction between signals and race
- Are the results consistent with a simple model of search with discrimination?
 - Look for impact of share of Black and “very prejudiced” on markup gaps

Rough descriptive test: Does negotiation skill matter for markup?

Markup proportions and amount by quartile of price paid for vehicle:

	Quart. 1	Quart. 2	Quart. 3	Quart. 4
Markup Amount	1.028 (0.943)	1.053 (0.916)	1.062 (0.906)	1.084 (0.898)
Prop. Marked Up	0.660 (0.474)	0.675 (0.468)	0.683 (0.465)	0.696 (0.460)
Black	0.124 (0.215)	0.126 (0.218)	0.125 (0.217)	0.123 (0.216)
N	> 1M	> 1M	> 1M	> 1M

Note – Price quartiles are determined controlling for a vehicle's make, model, year, new/used status, and region (to account for geographic differences in demand). Standard deviations in parentheses.

Test of Becker-style taste-based discrimination

- Becker-style models of taste-based discrimination have a sharp prediction:
 - Disparity should be closely related to “marginal” prejudice.
 - Disparity should not be related to “average” prejudice.
- I evaluate this against the markup data by:
 - Approximating marginal prejudice with the b^{th} percentile of prejudice index for the region
 - Assigning race by maximum a posteriori (MAP) assignment
 - Calculating the Black/White markup gap
 - Regressing the gap on the marginal and average prejudice.
- The Becker model predicts a positive, significant coefficient on marginal, and a negligible coefficient on average.

Results: Test of Becker-style taste-based discrimination

	"Core" Index	
	Naive	Clustered*
Marginal Index	0.684 (0.000)	0.532 (0.001)
Average Index	0.079 (0.000)	0.131 (0.337)
N	> 7M	> 7M
R ²	0.016	0.025

* 8 percent of observations do not have a date reported. These are included in the naive specification (using state means for prejudice index), but excluded from the clustered specification. Note – Results presented in interest rate points (e.g. 0.50 = 50 basis points). Dependent variable is residualized markup gap controlling for state and quartile of price paid for vehicle. "Core" index is the preferred measure of prejudice. A one-unit increase in the index indicates a one standard deviation increase in the prejudice indicated by the component questions. Clusters are state/year.

Results are strongly consistent with Becker predictions, but could still be an information story

- For statistical discrimination to be plausible, we need:
 - Different average levels of financial sophistication across Blacks and Whites
 - Reasonably informative signals that we know are observed by dealers
 - Different returns to signals of financial sophistication
- Here I use FICO scores signals of financial sophistication (higher FICO indicates “better” credit history and more sophistication)

Results: Test of statistical discrimination using FICO as signal (Black x FICO is coefficient of interest)

	"Core" Index	
	Naive	Clustered
Black x Marg. Index	0.529 (0.000)	0.529 (0.001)
Black x Avg. Index	0.022 (0.000)	0.022 (0.809)
FICO	0.000045 (0.00)	0.000045 (0.167)
Black x FICO	-0.000005 (0.018)	-0.000005 (0.845)
N	> 7M	> 7M
R ²	0.025	0.025

Note – Results presented in interest rate points (e.g. 0.50 = 50 basis points). Dependent variable is residualized markup controlling for state and quartile of price paid for vehicle.

Interpretation

- In every specification, the results are consistent with Becker-style taste-based discrimination.
 - Maybe more than “consistent,” as sharp predictions satisfied.
- There no evidence suggesting that statistical discrimination may also be at play.
 - A black customer moving from the minimum to maximum FICO score would have less than a 1 basis point impact on the predicted gap.
- There no evidence suggesting that a search model with discrimination is consistent with the observed outcomes.
 - The predicted gap actually declines as the share of population that is prejudiced increases. (results not presented here)

Some Conclusions I Hope You Take From This

- The market for indirect auto loans is perhaps an ideal one for an analysis of economic discrimination.
 - Evidence suggests markup of indirect auto loans is likely affected by taste-based discrimination.
 - There is also evidence that is specifically inconsistent with statistical discrimination and search with discrimination.
- The market for autos and auto financing is interesting, economically important, and likely under-explored.
 - Complex interactions with lots of potential for behavioral and informational idiosyncrasies.
 - Amongst the largest transactions in a consumer's financial life.
 - (The CFPB's supervisory data can potentially address the "under-explored" part...)