High-Frequency Location Data Shows That Race Affects the Likelihood of Being Stopped and Fined for Speeding

Based on BFI Working Paper 2022-160, "High-Frequency Location Data Shows That Race Affects the Likelihood of Being Stopped and Fined for Speeding," by Pradhi Aggarwal, Lyft; Alec Brandon, Johns Hopkins University; Ariel Goldszmidt, Lyft; Justin Holz, University of Chicago; John A. List, University of Chicago; Ian Muir, Lyft; Gregory Sun, Washington University; and Thomas Yu, Lyft

Relative to a white driver traveling the same speed, minorities are 24 to 33 percent more likely to be stopped for speeding and to pay 23 to 34 percent more in fines.

Given news reporting in recent years, many readers are likely familiar with research which finds that, conditional on an encounter, police officers are more likely to enforce a law, conduct a search, or use force when a civilian belongs to a racial minority group. In other words, once they are stopped, minorities are more likely to face some police action. However, what research has yet to show is whether minorities are stopped more in the first place.

This new paper addresses the issue of minority status and the likelihood of police encounters by reviewing driving data from Lyft records in Florida from August 2017 to August 2020, totaling over 40 billion observations. These data allow the authors to explore whether minority drivers, because they are minorities, are more likely to be stopped and to be issued a citation. To examine this question, the authors focus on citations for speeding.

Please see the full working paper for more details on the authors' methodology, but it is important to note that to operate on the Lyft platform, drivers must use a smartphone that communicates their location in real time. Combining this information with administrative data on driver race and police stops for speeding, allows the authors to directly measure the effect that driver race

has on the probability of being stopped for speeding. The authors find the following:

- Minority drivers are 24 to 33 percent more likely to receive a speeding ticket for traveling the same speed as white drivers.

- These differences amount to minority drivers paying 23 to 34 percent more in fines for the same level of speeding as white drivers. Importantly, both of these differences are highly statistically significant.

- Further, there is no evidence to support the notion that police punish minority drivers more harshly because of differences in re-offense or accident rates.

For policymakers and business leaders, these findings offer salient insights. For example, relative to police officers, automated technologies such as speeding cameras could help reduce selective enforcement of traffic regulations. And for car insurance, where rates typically increase when drivers are cited for speeding, this research indicates that such citations are not blind to driver race. Taken together, accounting for race in the relationship between citations and insurance rates could help diminish the impact of racial differences in the enforcement of speeding regulations.

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Finally, a note about research: While these findings are not guaranteed to generalize beyond drivers on Lyft's platform or Florida, the authors' research design allows for such an evaluation. In addition, this research illustrates how an application of high-frequency location data can apply to other important questions, like geographic mobility and racial differences in voting wait time.

Bottom line: The authors' novel research design advances our scientific understanding of race effects in policing, and provides further justification for policy interventions to ameliorate these effects.

Figure 1 • Effect of Driver Race on Police Enforcement of Speed Limits

Average Number of Citations and Fines for White and Minority Drivers Using Fixed Effect (FE) and Double Machine Learning (DML) Models
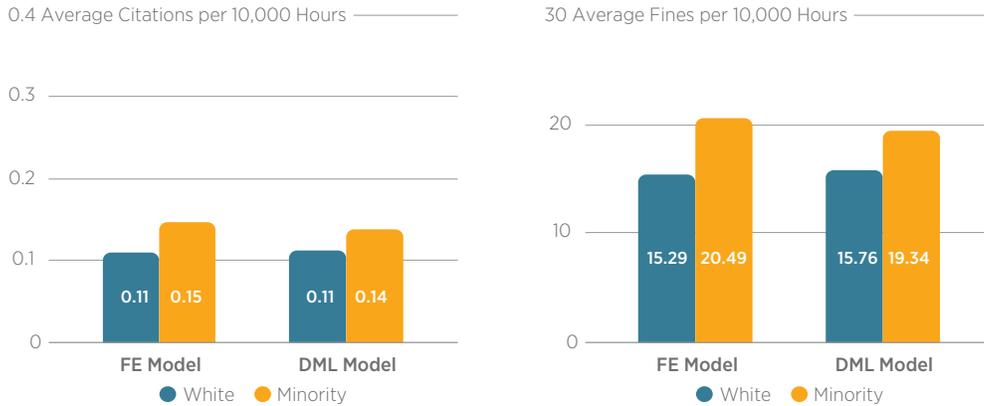
Differences in Citations and Fines for White and Minority Drivers Using FE and DML Models

Note: This figure plots the citation and fines associated with each race group of drivers.

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