

# UCLA ECONOMIC LETTER

## REAL ESTATE AND THE MACROECONOMY

*A partnership between the UCLA Ziman Center for Real Estate and the UCLA Anderson Forecast sponsored by the Ziman Center's UCLA Rosalinde and Arthur Gilbert Program in Real Estate, Finance and Urban Economics*

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Monthly condensed analyses of crucial real estate and economic issues offered by UCLA Anderson Forecast and UCLA Ziman Center for Real Estate. In this December 2022 Letter, M. Keith Chen, Katherine L. Christensen, Elicia John, Emily Owens and Yilin Zhuo summarize their study of smartphone data mapping police activity and racial disparities in a wide range of U.S. neighborhoods.

This Economic Letter is extracted from a larger report: [Smartphone Data Reveal Neighborhood-Level Racial Disparities in Police Presence](#). The full report includes all citations and graphs.

## Smartphones Reveal Racial Disparities by Police

*By M. Keith Chen, Katherine L. Christensen, Elicia John, Emily Owens and Yilin Zhuo*

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Research on policing has primarily focused on documented actions such as stops and arrests. Much less is known about patrols and presence. We map the neighborhood movement of nearly ten thousand officers across 21 of America's largest cities using anonymized smartphone data. The conclusions are highly revealing. Police spend 8.2% more time in neighborhoods that are twice as Black as the city overall. This disparity persists after controlling for density, socioeconomic, and crime-driven demand for policing. And the time amount is lower in cities with a higher share of Black police supervisors (but not officers). Differences in police presence statistically explain 60% of the Black-White disparity in arrests.

*"About one third of the higher police presence in more Black neighborhoods cannot be explained by neighborhood characteristics."*

According to FBI statistics, in 2019 Black people in America were arrested at twice the rate of White people. A large literature explores the causes of racial disparities in police enforcement actions, such as stops, searches, and arrests, including differences in socioeconomic status, criminal activity, and biased decision making by police officers. Disparities in police enforcement are highly consequential for impacted civilians but may not fully reflect disparities in the entirety of what it means for an area to be “policed.”

Police presence can deter crime. It can also influence when and where crime is officially recorded. Since police presence is necessary for a stop, search or arrest to occur, and the racial composition of neighborhoods varies both across and within cities, detailed information on where officers work during their shifts can identify sources of disparities in later criminal justice outcomes. Unfortunately, few departments record detailed data on where officers are during their shifts, and even fewer make it available to researchers in a standardized way.

In this paper, we provide evidence on the following question: Do police departments differentially patrol the more heavily Black, Hispanic, or Asian neighborhoods in their cities? We use anonymized smartphone location data to identify and track the movements of individual police officers on patrol in 21 of the largest cities in the United States. We measure police presence as the total number of officer-hours spent in a census block group (a “neighborhood” with roughly 1,000 residents) over a 10-month period (Feb 2017 - Nov 2017), when the officer is moving through a neighborhood at 50 mph or less. These data identify where police spend their time and allow us to evaluate spatial patterns of policing at scale while protecting officer privacy.

Using these data, we quantify how patterns of socioeconomic status, crime, social capital, and race relate to local police presence within and across these cities. While we do not evaluate whether such resource allocation is socially optimal, we document the following facts: (1) Officer presence tends to be higher in relatively non-White neighborhoods, both within and between cities, (2) Black neighborhoods have the highest officer presence and though, (3) the officer presence disparity in Hispanic and Asian neighborhoods can be fully explained by neighborhood characteristics, 4) about one third of the higher police presence in more Black neighborhoods cannot be explained by neighborhood characteristics.

Generally, geographic analysis of policing at the sub-city level has measured policing in one of two ways. Researchers have studied downstream measures (outcomes of police officer and civilian interactions) and upstream measures (departmental decisions made before a civilian interaction – e.g. patrol assignments). Our research builds on a growing literature that examines the role of upstream measures of policing in Dallas, in an English police department, and in Milan. We extend these single city studies in two key ways. First, our smartphone dataset allows us to examine actual police presence in neighborhoods, rather than beat assignment or patrol car locations; this allows us to observe the potentially nontrivial amount of time officers spend outside their assigned patrol locations or their patrol car. Second, because our smartphone dataset is independent of city-level decisions to collect or release data, we can extend the single-city analyses that typify existing upstream studies to better understand policing within and across 21 of America’s largest cities.

Our neighborhood-level analysis of GPS location data shows that police officers spend more time in places with larger Black, Hispanic, or Asian populations relative to the city overall. While controlling for variation in socioeconomic status, social disorganization, and violent crime reduces these disparities, it does not eliminate the disparity in officer time spent in relatively more Black vs. more White neighborhoods. This suggests that social interventions targeted at the “root causes” of crime may be unlikely to eliminate the Black-White disparities we observe in American policing and confirms qualitative and historical research on upstream police presence across America, and patterns observed at the city level.

While still descriptive, we also explore whether differences in police presence are associated with the racial composition of officers across cities. Consistent with existing single-department studies, our results suggest that the additional police presence in Black neighborhoods is lower in cities where more police officers are Black. However, this is statistically explained by the share of Black front-line supervisors, who direct patrol officer activity, rather than by the share of Black patrol officers walking the beat. While not causal, this highlights the potential role of retention and promotion in police reform aimed at reducing racial disparities in the criminal justice system. We also provide evidence that the nature of disparities in police presence differs across US cities. While racial disparities in some cities (e.g., Charlotte, NC) are largely associated with spatial differences in socioeconomic status (e.g., income, education, and civic engagement) others persist after controlling for these factors, and for spatial patterns of violent crime (e.g. Austin, TX).

Our work complements existing spatial analyses of downstream measures of policing, which have found that police engage in more enforcement actions in Black neighborhoods. In the six cities (including New York City) with publicly available geocoded arrest data, we connect our upstream measures of neighborhood police presence to downstream arrests within that neighborhood. We then separate observed arrest disparities into two parts: percent differences in officer-hours spent in a neighborhood and percent differences in arrests per officer-hour spent in that place. We find that differences in where officers spend time explain roughly 60% of the Black-White disparity in neighborhood arrests, conditional on neighborhood characteristics. Officers' higher propensity to make an arrest, conditional on being in a relatively more Black neighborhood, explains 40% of these disparities.

Taken as a whole, our findings suggest that disparities in exposure to police in the U.S. are associated with both structural socioeconomic disparities and discretionary decision making by police commanders and officers. This new and wide-ranging data may be valuable for creating policy interventions to remedy these disparities. And, our new measures of police presence are a benchmark for evaluating downstream police actions.

*M. Keith Chen is Professor of Behavioral Economics at the UCLA Anderson School of Management. Katherine L. Christensen is Assistant Professor in the Marketing department at the Kelly School of Business, Indiana University. Elicia John is Assistant Professor Department of Marketing at American University. Emily Owens is Chair of the Department of Criminology, Law, and Society at the University of California, Irvine. Yilin Zhuo is Ph.D. Student in Behavioral Decision Making at UCLA Anderson School of Management.*

