Police Killings and Municipal Reliance on Fine-and-Fee Revenue

BRENDEN BECK

High-profile police killings in the United States have drawn attention to how municipalities generate revenue through citations and arrests. This article investigates whether killings by police are more frequent in places that rely on fine-and-fee revenue by first describing the types of municipalities that collect the most money from monetary sanctions. It then analyzes whether fine-and-fee reliance and a municipality's status as urban, suburban, or rural are associated with police killings. Descriptive statistics and negative binomial models reveal that suburbs with large Black populations rely the most on fine-and-fee revenue and police killings are higher in central cities than suburbs or rural towns. Cross-sectional and longitudinal regression models find that municipalities that rely more on fines and fees have more police killings, suggesting municipal fiscal imperatives influence police violence.

Keywords: police killings, fines and fees, suburbs, municipal budgeting, fiscal sociology

After a police officer shot and killed Michael Brown in Ferguson, Missouri, in 2014, a U.S. Department of Justice investigation found the St. Louis suburb "consistently set maximizing revenue as the priority for its law enforcement activity . . . independent of any public safety need" (Department of Justice 2015, 9). Ferguson's finance director had written to the municipality's police chief to request that police officers write more tickets to raise collections in the face of a "substantial sales tax shortfall" (10). Two years after Brown's death, a police officer shot and killed Philando Castile during a traffic stop in Falcon Heights, a St. Paul suburb. Castile, who was also a Black man, had been pulled over forty-nine times in the thirteen years before his death, mostly for minor, citation-generating infractions (LaFraniere and Smith 2016). That Ferguson is predominantly Black and Falcon Heights predominantly White underscores the diversity of suburbs (Lewis-McCoy 2018), but the two places are similar in that they have both relied heavily on criminal legal system fines and fees as revenue sources.

The killings of Brown and Castile raise questions about the interactions between policing

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and place. Do suburbs such as Ferguson and Falcon Heights rely on revenue from monetary sanctions more than central cities and rural towns do? Are police killings higher in suburbs than in other metropolitan areas? Do police in municipalities that rely more on fines and fees kill more people? This study analyzes data on 2,716 U.S. municipalities from 2009 to 2018 to address these questions.

As I discuss later, both fine-and-fee reliance and police killings are likely to be more frequent in suburbs. Tax revolts and a desire for exclusion led suburban leaders to create small municipalities with low property tax rates, leaving them in precarious fiscal positions and pushing them toward alternative revenue sources such as fines and fees. As suburbs' legacies of racial exclusion give way to increasing diversity, their demographic changes might combine with their need for fine-and-fee revenue to intensify policing.

Across all metropolitan areas, revenue-motivated policing is likely to increase police killings. Police contact can generate a range of monetary sanctions, from restitution and traffic tickets to court costs and user fees for services such as public defense and jail cell occupancy (Martin et al. 2018). As municipal governments face revenue shortfalls, they could pressure police to generate fines and fees, which pushes officers to make more contacts with the public as they seek lucrative citations and arrests, increasing opportunities for the use of deadly force. Such revenue-motivated policing has the potential to increase not just the frequency but also the intensity of police-public interactions as officers come to view civilians as sources of revenue rather than people to serve. Sharon Brett makes this point when she writes that "policing tactics used to impose and collect fines and fees, and the wide latitude given to police via Fourth Amendment jurisprudence to engage in such tactics, facilitates conditions similar to those in Ferguson and results in unnecessary and oppressive police violence" (2020, 17).

Police in the United States killed more than four hundred unarmed drivers and passengers during traffic stops between 2016 and 2021 (Kirkpatrick et al. 2021). These stops resulted in not only the death of Philando Castle but also the deaths of Sandra Bland, Duante Wright, and Walter Scott (Harris 2021). In this article, I investigate whether place characteristics and municipal budgeting interact to increase the frequency of such police killings.

CAUSES AND CONSEQUENCES OF FINE-AND-FEE RELIANCE

Prior to the 1970s, local governments could rely on property taxes to fund the bulk of their expenditures. That began to change in 1978 when two-thirds of Californians voted to cap real estate assessments, thereby limiting available property tax revenue. This tax revolt spread around the country as taxpayers, a newly salient identity, pressured state legislatures to reduce property taxes through a panoply of new laws. "Most states tried two or more different approaches to providing property tax relief," thereby reducing the revenue available to most municipalities (Martin 2008, 14; 2009). Other revenue sources similarly contracted after the 1970s and 1980s. State and federal aid to cities shrank, and many states limited the kinds of revenue-raising mechanisms localities were permitted to adopt (Pagano and Hoene 2018). These revenue reductions have degraded the quality of municipal services like education (Figlio and Reuben 2001), and they accelerated following the Great Recession of 2008.

In this highly restricted fiscal landscape, many municipalities replaced their lost property tax and intergovernmental revenues with sales taxes, user fees, and criminal justice fines (Pagano and Hoene 2018; Harris 2016; Gilmore 2007; Shadbegian 1999). Strapped-for-cash local executives and legislatures reduced funding for their judicial branches, leaving their courts to rely on fines, fees, and forfeitures to fund themselves. Judges and police chiefs learned the monetary sanctions they issued to defendants were necessary to keep their cities' court systems, public defenders, and police afloat (Alexander and Konanova 2010).

The resultant boom in monetary sanctions has had severe consequences for the people fined and their families. Monetary sanctions are intensely regressive and can easily compound, trapping people in cycles of debt (Harris, Evans, and Beckett 2010; Bannon, Nagrecha, and Diller 2010; Ordower, Sandoval, and

Warren 2017). One Washington state resident owed $72,000 in legal debt thirteen years after her assault conviction, struggling to make the minimum payments with her construction apprentice salary (Harris 2016, 55). Legal debts put the already poor under financial strain, threatening their jobs, housing, health, education, and family bonds (Paik and Packard 2019; Salas and Ciolfi 2017; Pattillo et al. 2022; Harris and Smith 2022). Some states revoke driver's licenses or reincarcerate people who fail to pay their fines and fees (Evans 2014; Bannon, Nagrecha, and Diller 2010). Monetary sanctions also make future criminal justice involvement more likely (Shannon et al. 2020; Piquero and Jennings 2017). The costs cascade out because the fines and fees are often paid by family members, usually women related to the person fined, and high fine rates are associated with higher poverty rates for entire neighborhoods (Page and Soss 2021; O'Neill, Kennedy, and Harris 2022). In the face of such intense consequences, understanding which cities and towns impose the highest fines and fees becomes important for understanding the geography of social inequality.

Places that rely heavily on fine-and-fee revenue share several characteristics. Fiscal stress is a strong predictor of high fine-and-fee reliance, and police often pursue revenue on behalf of their struggling local governments. When municipalities face budget shortfalls, their police make more arrests, issue more tickets, and seize more property (Edwards 2020; Su 2021; Garrett and Wagner 2009; Makowsky and Stratmann 2011; Graham and Makowsky 2021; Baicker and Jacobson 2007). Municipality size is another salient characteristic. Smaller municipalities issue more monetary sanctions, in part to compensate for smaller tax bases (Graham and Makowsky 2021; Maciag 2019; Mughan 2021).

More troublingly, places with large Black populations issue more fines, such that even predominantly Black municipalities with high incomes frequently resort to heavy use of monetary sanctions (Fagan and Ash 2017; Sances and You 2017; Pacewicz and Robinson 2021; Rios 2019). The socioeconomic advantages of middle-class, majority-Black municipalities do not translate to fiscal advantages as readily as for majority-White places, in part because businesses are less likely to locate or invest in predominantly Black locales and the real estate industry is less likely to accurately value homes there (Simms 2023, this issue).

This study builds on research to examine how fine-and-fee collection varies across another place characteristic: urbanicity (a municipality's status as urban, suburban, or rural). Some descriptive research suggests suburbs collect more in fines and fees than other metropolitan areas (Fernandes et al. 2019; Rios 2019). This study extends that research by analyzing whether something distinctly *suburban* leads to higher fine-and-fee collection or whether the difference is explained by suburbs' different demographic and crime patterns.

The typical American suburb combines several characteristics that contribute to its fine-and-fee reliance (Pacewicz and Robinson 2021). Suburbs are cut into small municipalities that compete for jobs and tax dollars, giving them smaller tax bases and deepening their need for alternative revenue sources (Kruse and Sugrue 2006). This Balkanization is partly by design. Predominantly White areas outside of cities often incorporated as small municipalities to exclude non-Whites and hoard resources (Wyndham-Douds 2023, this issue). This racist history was also expressed in suburban policing. Many suburbs, including Ferguson during the Jim Crow era, were "sundown towns" where police violently expelled Black people after dark (Loewen 2006). Suburbs are intensely segregated and housing discrimination there remains common (Larkin 2007). In predominantly White suburbs, police stop Black people who they perceive are "out of place" more frequently than they do comparable White people (Meehan and Ponder 2002). Despite this, suburbs are diversifying. Poor, working-class, immigrant, and non-White people are increasingly locating there (Kneebone 2017; Pattillo 2005). The Black middle class and immigrants are seeing particularly sharp growth outside cities (Zapatka and Tran 2023; Clergé 2023).

When the policy legacies of segregation, tax revolts, and sundown towns combine with the fiscal precarity and increasing diversity of suburbs today, the issuance and racial inequality

of monetary sanctions is likely to be intense. Most suburbs also lack the social safety nets of urban areas. Both governmental and nonprofit public assistance programs that might blunt the poverty-inducing harms of monetary sanctions are less common in suburbs (Allard and Pelletier 2023, this issue). These distinctly suburban conditions lead me to my first hypothesis: Places with large Black populations and suburbs of all types fund more of their budgets through fines and fees.

CONTEXTS OF POLICE KILLINGS

Estimating the prevalence of police killings has historically been difficult because of poor federal data collection and underreporting by coroners. That changed in 2015, when journalists and volunteers began collecting data from press accounts (Sharara and Wool 2021). These new sources of data have allowed a more thorough understanding of the contexts of fatal police encounters and helped facilitate a recent boom in research into police killings.

Crime is a common explanation for the use of deadly force. Police officers work difficult jobs and face frequent threats of violence in a country with many guns, so officers naturally respond with lethal force when and where crime is more intense, the thinking goes. This explanation is correct insofar as police killings are more frequent in places with high rates of violent crime, but crime is far from the only determinant of the rate of police killing (Gaston, Fernandes, and DeShay 2021; Siegel et al. 2021). Police killings are more common in economically poorer places and in southwestern metro areas (Feldman 2020; Schwartz and Jahn 2020; Siegel et al. 2021). They are less common where police are monitored by federal consent decrees and in northeastern metros (Goh 2021; Schwartz and Jahn 2020).

Police killings are also intensely racially disproportionate. Although the role of race as an individual-level factor in police killings is clear (Edwards, Esposito, and Lee 2018; Sharara and Wool 2021), the role of ethnoracial demographics as a contextual-level factor is less consistent. Larger Black populations are sometimes associated with fewer police killings, but not always (Siegel et al. 2021; Gaston, Fernandes, and DeShay 2021). Where the association is observed, scholars often attribute it to racial threat, the fear White people and White elites have about large Black populations and about demographic change (Gaston 2019).

The variation in police killings by places' class and racial makeup underscores how police are both shaped by and shape their surrounding environments (Gordon 2020). Contextual factors such as segregation and gentrification interact with law enforcement in dynamic ways (Bell 2020; Beck 2020; Lung-Amam and Schafran 2019). I argue that urbanicity is an important contextual characteristic for understanding police killings. Suburbs and cities have important differences that likely structure the frequency of police use of deadly force.

Although suburbs have a reputation as peaceful idylls, policing there can be intense, especially for Black people (Pacewicz and Robinson 2021; Boyles 2015; Meehan and Ponder 2002). Police in suburbs arrest more people for low-level, quality-of-life offenses than police in central cities do (Beck 2019). Research on police killings in suburbs, however, has been mixed. One media account found that police killings were more frequent and increasing more rapidly in suburbs than in cities, though the analysis did not adjust for population differences (Sinyangwe 2020). One county-level study found deaths in police custody were lowest in suburban areas, though it included only large counties in its analysis (Edwards, Esposito, and Lee 2018). The present study tries to reconcile these mixed findings by adjusting for population differences and including suburbs of different sizes.

Suburbs' intense low-level policing and the distinct characteristics that likely increase their fine-and-fee reliance (fragmentation, a history of fiscal conservatism, and new racial tensions) lead me to my second hypothesis: Police in suburbs kill more people than police in central cities.

Are Police Killings Higher in Places That Rely on Fines and Fees?

Regardless of urbanicity (a municipality's status as urban, suburban, or rural), I expect municipalities' fine-and-fee reliance will influence their frequency of police killings. Seeking rev-

enue will likely push officers to make more contacts with the public in search of citations and arrests. As the number of contacts grows, the proportion of them that end in deadly force will likely remain the same, so—holding all else constant—the total number of police killings will increase along with increased contacts.

Besides the number of contacts, I suspect their character will change as well. In Ferguson, city officials and police managers pushed frontline officers to increase their collection of fine-and-fee revenue without regard to public safety. This meant that "many officers appear[ed] to see some residents, especially those who live in Ferguson's predominantly African-American neighborhoods, less as constituents to be protected than as potential offenders and sources of revenue" (U.S. Department of Justice 2015, 2). People assessed fines and fees notice this attitude. They report the criminal legal system treats them "like [they] don't have any emotions" and are not human (Balko 2014, 2; Pattillo and Kirk 2020; Page and Soss 2021). I suspect this dehumanization and search for revenue will increase both the frequency and intensity of police contacts and thus police killings.

Although this is the first study to examine how fine-and-fee reliance correlates with police killings, evidence is strong that municipal budgetary needs influence other policing outcomes. True to the stereotype of speed traps, places that experience budget shortfalls issue more traffic tickets (Makowsky and Stratmann 2011; Garrett and Wagner 2009). Municipalities spend more on their police and make more drug arrests of Black and Hispanic people after their tax revenue declines (Beck and Goldstein 2018; Makowsky, Stratmann, and Tabarrok, 2019). Police departments in cities that rely more heavily on fines and fees solve fewer violent crimes, suggesting the search for fine-and-fee revenue directs police toward low-level enforcement and away from investigating serious crime (Goldstein, Sances, and You 2018). A strong research base shows that municipalities' fiscal climates affect their police officers' behavior. This leads me to my third and final hypothesis: Police killings are higher in municipalities that rely more on fines and fees for revenue.

RESEARCH DESIGN

To examine how urbanicity relates to fine-and-fee reliance and how that reliance, in turn, relates to police killings, I collected annual data on U.S. municipalities from 2009 to 2018. For this project, the municipality is a more appropriate scale than the county or census tract because I am studying municipal police departments, the most common type of law enforcement agency. Municipalities, which are sometimes called census-designated places, reflect the political boundaries of cities, towns, and villages. I use the terms *place* and *municipality* interchangeably, and each is an umbrella term that encompasses central cities, suburbs, and rural towns.

I omit municipalities that had fewer than ten thousand people in 2009 from the sample to avoid the data volatility common to small places. As I explain, this volatility was especially acute in the municipal finance data. Because police killings and fine-and-fee reliance are likely higher in small municipalities (Sherman 2018; Koslicki, Willits, and Brooks 2021), this population threshold represents a limitation of using these national data. Sensitivity analyses using lower population thresholds of one thousand and of five hundred found similar results, but future research might use more geographically limited but accurate data to assess places with fewer than ten thousand people.

The unit of analysis for this study is the municipality-year. I omit any municipalities or municipality-years missing data and any municipalities without police departments. The data selection process generated a sample of 16,319 municipality-years by using data from 2,716 municipalities, each providing an average of six years of data.

To operationalize municipalities' status as urban, suburban, or rural, I use a common definition built from the Office of Management and Budget's (OMB) principal cities geographies (OMB 2017; Kneebone and Berube 2013). Central cities are those the OMB determines are the principal cities in a metropolitan statistical area (MSA). Suburbs are municipalities in MSAs that are not the principal city. Rural towns are municipalities outside MSAs. Although some researchers point out that this

"census-convenient" definition emphasizes jurisdictional boundaries over place characteristics (Airgood-Obrycki and Rieger 2019, 3), the OMB determines principal cities in part based on social and economic integration as measured by commuting patterns, a salient place characteristic (OMB 2017). Political boundaries are also important to preserve for this analysis because they represent the jurisdictions of the municipal law enforcement agencies I analyze. The OMB urbanicity classification defines 544 of the sample municipalities as central cities, 1,716 as suburbs, and 456 as rural towns.

Data

I operationalize fine-and-fee reliance as *fines and fees as a percent of all municipal revenue*. Data on municipal fine-and-fee revenue comes from the Census of Governments (COG), an annual survey of state and local government finances conducted by the Census Bureau. The COG *Classification Manual* defines fines and fees (Code U30), as "Revenue from penalties imposed for violations of law; civil penalties (e.g., for violating court orders); court fees if levied upon conviction of a crime or violation; court-ordered restitutions to crime victims where government actually collects the monies; and forfeits of deposits held for performance guarantees or against loss or damage (such as forfeited bail and collateral)" (U.S. Census Bureau 2006, 40).

Note that the COG definition only includes revenue from criminal justice sources such as parking tickets, monetary penalties for crimes, and court fees. It does not include revenue from other noncriminal justice government sources like building or health code violations, over-due library books, or park-use fees. Although some of the COG documentation describes these data as "fines and forfeitures," the data exclude money collected through civil asset forfeiture, a related, but distinct, process through which police generate revenue through seizure of money or property.

The denominator for the fine-and-fee variable, *all municipal revenue*, is also from the COG. Some researchers might exclude, from the denominator, revenue transfers from higher levels of government to isolate just the revenue over which municipal governments have direct control. I keep intergovernmental transfers in the denominator because municipalities can anticipate such revenue and adjust their behavior accordingly. These and all monetary variables are inflation adjusted to 2018 dollars using the consumer price index deflator from the Bureau of Labor Statistics. Revenue figures derived from the COG might not be comparable to revenue figures from other sources because of different accounting practices, so caution should be used when comparing any finance figures in this study to, for instance, city budget documents or press accounts. In models where it is not a denominator or offset, I include *total municipal revenue* as a control because municipalities issue more fines and fees when revenue is down (Edwards 2020).

The second outcome of interest is *police killings per capita*. It is the total number of police killings per year per million residents in each municipality. These data come from Fatal Encounters, a dataset of civilian deaths following interactions with the police collected from news accounts. It is among the most accurate sources of data on police killings (Edwards, Lee, and Esposito 2019; Campbell, Nix, and Maguire 2018; Feldman et al. 2017; Finch et al. 2019). Missingness in the data compromises the accuracy of Fatal Encounters' race-ethnicity data (Finch et al. 2019), so those results are interpreted with caution. Data are also less accurate before 2008 (Edwards, Lee, and Esposito 2019), so I limit analyses to 2009 and later. The incident-level data were aggregated to the municipal level using the Stata package Geoinpoly (Picard 2015). Following convention, I exclude from the count of police killings all suicides, accidental deaths, deaths caused by vehicle crashes, and other deaths not directly caused by police action (Edwards, Esposito, and Lee 2018; Nix and Lozada 2021). The remaining deaths in the data are those that resulted from gunshot, asphyxiation, beating, medical emergency, or taser.

I do not distinguish between justified and unjustified killings or armed and unarmed decedents for two reasons. First, such distinctions are difficult and subjective to determine Second, the policymaker and public interest in preventing even "justified" killings through the

use of nonlethal force and de-escalation techniques because "even legal shootings pose a risk to both police and state legitimacy" (Sherman 2020, 11).

Police advocates stress that the use of deadly force is the unfortunate consequence of working a difficult job, especially in high-crime places. To account for this, I control for both the *violent crime rate* which represents how much violence police might expect to confront and the *property crime rate* which represents a more frequent form of crime that, if increasing, might generate more police-civilian contacts regardless of any revenue-generation motives. Crime data come from the FBI's Uniform Crime Report (UCR) and represent all crimes made known to the police either through a civilian report (usually via 911) or by police action (police observing the crime) (Kaplan 2020). Both crime variables are per thousand residents.

Researchers debate whether to control for arrests when modeling police killings. On the one hand, we might want to capture the universe of all police-civilian interactions to understand what percent of them end in death, and arrests might be a blunt but effective proxy count of police-civilian interactions (Nix 2020). However, because I suspect police increase arrests when they are seeking revenue, I do not want to control away the variation in policing behavior I am trying to observe. Thus I follow Gabriel Schwartz and Jaquelyn Jahn (2020) and omit arrests. Future research might investigate whether arrests mediate between fine-and-fee reliance and police killings.

I control for the *number of police officers* in each place to capture which places might have more police killings simply because they have more police. These data come from the FBI's Law Enforcement Officers Killed in Action dataset (Kaplan 2021).

The American Community Survey provides data on municipalities' demographics. I control for municipalities' *percent non-Hispanic Black*, *percent Latino*, and *percent non-Hispanic Asian* to capture how Whites' fears of changing ethnoracial demographics might be motivating fine-and-fee collection and police killings (Gaston, Fernandes, and DeShay 2021). All the American Community Survey variables use the survey's 5-year samples. These data are more accurate than the 3- and 1-year samples. I treat these variables as if they were measured in the final year of the sample (for example, the 2007–2011 data in 2011). This approach ensures that all the independent variables are measured before the outcomes, mitigating reverse causality.

I control for an index of municipalities' *economic advantage* that combines the percentage of the municipality's residents not in poverty, its median income, the percentage of its residents with a bachelor's degree, and the percentage employed. Combining them into an index using factor analysis avoids problems of multicollinearity. All four variables loaded onto the same factor with an Eigenvalue of 2.95 and factor loading scores between 0.62 and 0.87.

I control for municipalities' *percent young men* to capture the presence of people most likely to commit crime and most likely to be targeted by police. I also control for the *percent of vacant housing units* as a proxy for disorder.

Both UCR and COG data include some unrealistic outliers that suggest data input error. To account for the most extreme cases, and following Li Goh (2020), I remove any municipality-year of data from the UCR and COG data if the value is more than three standard deviations outside the municipality's ten-year (2009–2018) mean. This reduced the sample by 0.4 percent.

TRENDS IN FINE-AND-FEE RELIANCE AND POLICE KILLINGS

Table 1 presents the means and standard deviations of the variables as well as the measures in 2009, 2018, and the changes between the years.

Figure 1 describes how fine-and-fee reliance varies by municipalities' urbanicity and their share of Black residents. Represented by the darkest shading, suburbs with large Black populations rely the most on fine-and-fee revenue. The typical suburb that is 15 to 95 percent Black gets more than 2 percent of its budget from fines and fees. Rural towns with very few Black people rely the least on fines and fees, getting only 0.7 percent. This chart provides descriptive evidence that fine-and-fee reliance varies by urbanicity and the Black share of the population.

These fine-and-fee revenue percentages might seem small. As I explain later, even seemingly small revenue sources take on outsized

Table 1. Variable Means, *N* = 16,319 Municipality Years

	2009	2018	Percentage Change 2009 to 2018
Police killings per million people	2.66	3.44	29.32
	(10.56)	(11.12)	
Police killings of Black people per million Black people	11.40	14.31	25.52
	(89.73)	(66.80)	
Percent of revenue from fines and fees	1.35	1.22	−9.63
	(1.52)	(1.53)	
Fines and fees per capita (dollars)	26.03	24.93	−4.23
	(26.59)	(30.54)	
Violent crime rate per thousand	4.09	3.67	−10.27
	(4.04)	(3.49)	
Property crime rate per thousand	35.68	27.51	−22.90
	(18.70)	(16.05)	
Number of police officers per thousand	1.94	1.90	−2.06
	(0.76)	(0.76)	
Total revenue less fines and fees per capita	2,467.29	2,490.32	0.93
	(1,793.20)	(1,826.04)	
Percentage Black	11.57	12.00	3.72
	(16.32)	(16.57)	
Percentage Latino	12.36	13.48	9.06
	(16.12)	(16.01)	
Percentage Asian	3.51	3.96	12.82
	(5.15)	(5.44)	
Index of economic advantage	0.06	0.06	0.00
	(0.96)	(0.99)	
Percentage young men	14.92	14.59	−2.21
	(4.05)	(4.05)	
Percentage vacant housing units	9.26	9.68	4.54
	(5.50)	(6.40)	
Population	56,441.34	57,442.36	1.77
	(122,223.00)	(132,249.50)	

Source: Author's calculations based on Fatal Encounters, Census of Governments, Uniform Crime Report, Law Enforcement Officers Killed in Action, and American Community Survey data.
Note: Standard errors in parentheses.

importance in the context of municipalities' extremely constrained fiscal options, but one would be right to wonder whether the small portion of total revenue that comes from fines and fees could affect police killings. The multivariate analyses that follow test this question.

Figure 2 depicts trends in police killings over time in each metropolitan context. For every year measured, central cities experienced more police killings than suburbs, contradicting my hypothesis. In some years, central cities experienced nearly twice as many police killings as suburbs. However, the two metropolitan types are converging as central cities have been trending downward since they peaked at 5.5 per million in 2013 and killings in suburbs have been trending up. Rural towns experienced considerable volatility with no clear trend.

As this figure shows, police killings are more frequent in central cities than suburbs.

Figure 1. Average Percentage of Revenue from Fines and Fees, 2009–2018

		Percentage Black				
		0–1	2–4	5–14	15–95	total
Urbanicity	city	0.9	1.0	1.1	1.1	1.0
	suburb	1.1	1.3	1.6	2.3	1.6
	rural town	0.7	1.1	0.9	1.3	1.0
	total	1.0	1.2	1.3	1.7	1.3

Source: Author's calculations based on Census of Government and American Community Survey data.
Note: All figures are in percentages.

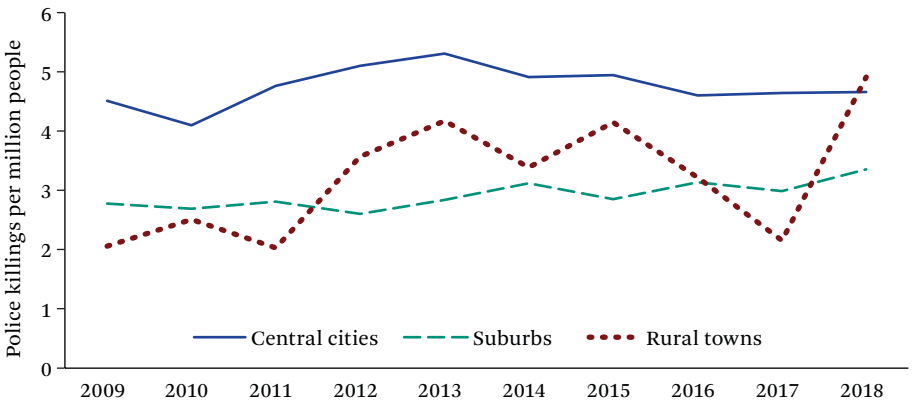
This is the opposite finding of a news article by Samuel Sinyangwe (2020). To determine what accounts for these contradictory findings, I replicated Sinyangwe's analysis and found that his use of raw counts and my adjusting for population differences explains the divergent results. Because of the additional information they provide, I use the population-adjusted, per capita figures in this study.

Next, I separated municipalities into quartiles by the percent of their budget that comes from fines and fees. Figure 3 shows the frequency of police killings in the lowest and highest quartiles, disaggregated by urbanicity. Across all metropolitan contexts, police killings are higher in municipalities that get a larger portion of their revenue from fines and fees, with high-reliance central cities experiencing the most police killings and low-reliance suburbs and rural towns experiencing the least. The spread between high- and low-reliance places was highest for rural towns. Next, I present an analytic strategy designed to assess whether these descriptive findings hold up when controlling for confounding variables in a multivariate context.

Analytic Strategy

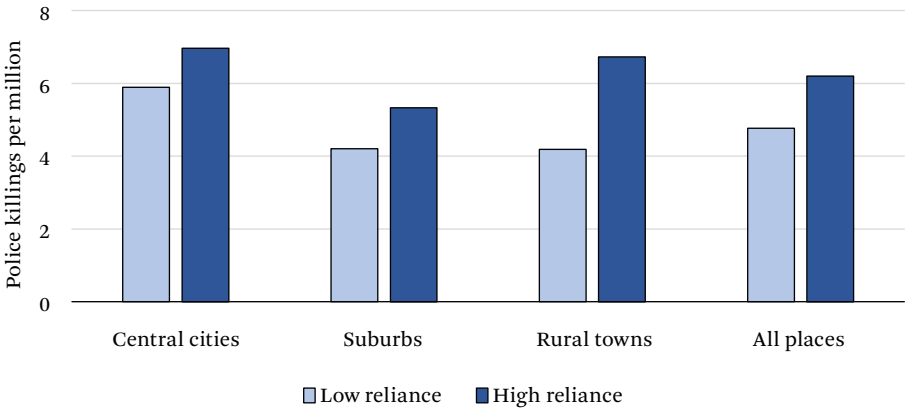
The goals of this study are to understand how urbanicity and the share of the Black population relate to fine-and-fee reliance, how urbanicity relates to police killings, and how fine-and-fee reliance relates to police killings. Because no municipality's status as a city, suburb, or rural town changed during the study window, questions of urbanicity require cross-sectional models that make comparisons between places rather than within places over

Figure 2. Police Killings by Urbanicity



Source: Author's calculations based on Fatal Encounters and American Community Survey data.

Figure 3. Police Killings by Fine-and-Fee Reliance and Urbanicity, 2009–2018



Source: Author's calculations from Fatal Encounters and American Community Survey data.

time. The distributions of both fines and fees and police killings are strongly positively skewed, suggesting negative binomial models, the models I use. Logit models with dichotomized outcomes revealed substantively identical results. To leverage all the years of panel data available (2009–2018), I pooled observations from all the years and included dummy variables for each year, creating year fixed effects (Wooldridge 2019, 427). Year fixed effects remove secular trends that might have affected all municipalities in a given year like large numbers of Black Lives Matter protests or greater media attention to police killings. Omitting year fixed effects yields very similar results. Using rate outcomes as dependent variables can lead to bias, so I modeled the outcomes' counts and included offset terms on the right side of the equation (Powers and Xie 1999). These offset, or exposure, variables represent the pool of cases that could be "exposed" to the outcome (that is, people who could be killed by police) thus offsetting the likelihood that more populous places will have more opportunities for police killings. They are the natural logarithms of each municipalities' population or total revenue, depending on the model.

I clustered standard errors by municipality to account for the correlated errors caused by including multiple years of data from each municipality (Sayrs 1989). The negative binomial models take the following form:

$$y_{it} = \alpha + \beta x_{it} + \beta z_{it} + \log E_{it} + \varepsilon_{it}$$

where y_{it} is the outcome variable in municipality i in year t (outcomes are fine-and- fee revenue in the first set of models and the number of police killings in the second set), α is the intercept, β represents the coefficients of interest, x is the key explanatory variable (urbanicity in some models and percent of the budget from fines and fees in others), z is a vector of control variables including the year dummies, E is the offset variable (population or total revenue) and ε_{it} represents the standard errors clustered by municipality i.

The negative binomial models examine a time-invariant characteristic, urbanicity, so they model differences between municipalities. Because both fine-and-fee reliance and police killings vary over time, I also analyze the relationship of those variables in longitudinal regression models. I use linear fixed-effects models to leverage the full panels of data and analyze change over time within municipalities. Fixed-effects models have the benefit of controlling for all unobserved, time-invariant municipality characteristics by fixing the intercept for each municipality (Allison 2009; Vaisey and Miles 2017). This accounts for place characteristics such as urbanicity, region, state, political climate, local government structure, police department organization, and any other characteristics that did not change between 2009 and 2018. To investigate possible period effects, I conducted an analysis with a dummy variable for observations before 2014 and those 2014 and later, and the results were substantively identi-

cal to those below. I again cluster standard errors by municipality to purge serial autocorrelation and the models take the following form:

$$y_{it} = \alpha_t + \beta x_{it} + \beta z_{it} + \upsilon_i + \varepsilon_{it}$$

which adds to the cross-sectional models υ_i, a municipality-specific fixed effect. After testing the main hypothesis, I analyze two subgroup questions: does fine-and-fee reliance relate to police killings of Black people or relate to police killings in suburbs alone? For the model of killings of Black people, I omit places with fewer than one hundred Black people to exclude extreme outliers.

MULTIVARIATE RESULTS

Table 2 displays the incidence rate ratio (IRR) results of the negative binomial regression models run on all the sample municipalities. Model 1 in table 2 estimates fine-and-fee reliance as a function of urbanicity and other covariates. It reveals that, in line with the descriptive table above, suburbs collected 45 percent more in fine-and-fee revenue than central cities and this difference was statistically significant (100*0.45=45; IRRs are exponentiated coefficients, so those IRRs higher than one reflect a positive relationship and those lower than one a negative relationship). Rural towns did not differ, at a statistically significant level, from central cities in the percent of their budgets derived from fines and fees.

Also confirming table 2, the percentage of a municipality that is Black is positively related to fine-and-fee reliance. A 1 percent larger Black population is related to a 1 percent larger proportion of the municipal budget derived from fines and fees. The Latino and Asian shares of places were unrelated to their fine-and-fee collection.

Model 1 reveals considerable variation by region. Midwestern municipalities collected 111 percent more from monetary sanctions than northeastern ones (100*1.11=111), southern ones collected 144 percent more (100*1.44 =144), and western cities 109 percent more (100*1.09=109).

As shown by a statistically significant coefficient lower than one, crime was inversely related to fine-and-fee reliance, suggesting that it is not merely the increase in finable behaviors that accounts for a municipality's budget share from monetary sanctions. For each additional violent crime per thousand people in a municipality, the local government collected 4 percent less in fine-and-fee revenue (100* (1–0.96)=4). Property crime showed a similar relationship though at a weaker magnitude. As shown by the statistically significant coefficient larger than one, places with more police officers relied more on fine-and-fee revenue, perhaps reflecting their increased capacity to issue fines and fees. Economic advantage was unrelated to fine-and-fee reliance.

Model 2 repeats the analysis from model 1, but with fines and fees per capita as the outcome. The results are largely consistent under this alternate model specification, indicating the results are robust to this research design choice.

To test the hypothesis that greater fine-and-fee reliance is related to more police violence, model 3 regresses the number of police killings on municipalities' percent of revenue from fines and fees and other covariates. The analysis reveals municipalities that funded 1 percent more of their budgets from fines and fees experienced 4 percent more police killings. Measuring fines and fees per capita, as model 4 does, reveals similar results, with a $10 increase in fines and fees per resident relating to a 2 percent increase in police killings.

Urbanicity is consequential for police killings, but not in the direction I hypothesized. Police in suburbs were involved in 14 percent fewer deaths than police in central cities. Police in rural towns were involved in 38 percent fewer. This aligns with the findings from table 2, confirming the observed differences between metropolitan types are statistically significant. Sensitivity analyses, available on request, which included municipalities with as few as five hundred people, showed nearly identical results, suggesting this relationship is not an artifact of the population threshold.

Police killings were higher in the South and West than the Northeast, and they were higher in municipalities with more crime, municipalities that were less economically advantaged, and those with larger Latino populations.

Model 4 duplicates model 3, but with fine-

Table 2. Incidence Rate Ratios, Negative Binomial Models

	(1) Proportion of Revenue from Fines and Fees	(2) Fines and Fees per Capita	(3) Police Killings per Capita	(4) Police Killings per Capita
Urbanicity (reference category is central city)				
Suburb	1.45***	1.16**	0.86**	0.86**
	(0.08)	(0.06)	(0.05)	(0.05)
Rural town	0.94	0.90	0.62***	0.63***
	(0.07)	(0.06)	(0.06)	(0.06)
Region (reference category is Northeast)				
Midwest	2.11***	1.88***	1.18	1.16
	(0.16)	(0.12)	(0.14)	(0.18)
South	2.44***	2.02***	1.35**	1.33*
	(0.21)	(0.15)	(0.15)	(0.15)
West	2.09***	1.82***	2.30***	2.23***
	(0.19)	(0.14)	(0.26)	(0.26)
Crime and police characteristics				
Violent crime rate	0.96***	0.97***	1.04**	1.03*
	(0.01)	(0.01)	(0.01)	(0.01)
Property crime rate	0.99*	1.00	1.01**	1.03**
	(0.00)	(0.00)	(0.00)	(0.01)
Number of police officers	1.19***	1.41***	1.08	1.06
	(0.06)	(0.06)	(0.05)	(0.05)
Municipality characteristics				
Total revenue less fines and fees	-offset-	1.00	1.00	1.00
		(0.00)	(0.00)	(0.00)
Percent Black	1.01***	1.01***	0.99	0.99
	(0.00)	(0.00)	(0.00)	(0.00)
Percent Latino	1.00	1.00*	1.00**	1.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Percent Asian	0.99	0.99	0.99	0.99
	(0.00)	(0.00)	(0.00)	(0.00)
Index of economic advantage	0.94	1.06*	0.77***	0.81***
	(0.03)	(0.03)	(0.05)	(0.03)
Percent young men	1.02**	1.02***	0.98	0.99*
	(0.01)	(0.00)	(0.01)	(0.01)
Percent vacant housing units	0.99	1.00	1.00	1.00
	(0.00)	(0.00)	(0.00)	(0.00)
Population	0.99*	-offset-	-offset-	-offset-
	(0.00)			
Fines and fees				
Percent of revenue from fines and fees			1.04*	
			(0.02)	
Fines and fees per capita ($10s)				1.02**
				(0.01)
Constant	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
N (municipality years)	16,319	16,319	16,319	16,319

Source: Author's calculations based on Fatal Encounters, Census of Governments, Uniform Crime Report, Law Enforcement Officers Killed in Action, and American Community Survey data.
Note: Standard errors in parentheses. IRRs for the year fixed effects omitted for concision.
*$p < .05$; **$p < .01$; ***$p < .001$

and-fee revenue measured as dollars per resident rather than percent of revenue. Switching the offset, or exposure, variable does not substantively change the results; they are robust to this alternate modeling approach.

The cross-sectional models in table 2 reveal that variation in fine-and-fee reliance *between* municipalities is related to police killings. I am also interested in whether variation *within* municipalities over time corresponds to fluctuations in police killings. For this, I constructed longitudinal models. Those results are presented in table 3. Models 1 and 2 reveal that fine-and-fee revenue, whether measured as a percentage of all revenue or as dollars per resident, was related to more police killings within places over time. Municipalities that increased the percent of their budgets from fines and fees by 10 percent saw an associated increase of 3.5 police killings per million residents. As table 1 shows, the typical municipality decreased its reliance on fines and fees 9.63 percent between 2009 and 2018, a decrease this model expects would correspond to 3.4 fewer police killings per million.

I expected that the connection between fine-and-fee reliance and police killings would be especially acute for killings of Black people and in suburbs. Model 3 in table 2 regresses police killings of Black people on fine-and-fee reliance and the controls. It finds that though the coefficient for fine-and-fee reliance is much larger than in model 1 and in the same direction, it is not statistically significant. Additional models, omitted here for concision, of killings of Latino, Native American, and Asian people also revealed no statistically significant relationship with fine-and-fee reliance. Model 4 tests the relationship between police killings of all people and fine-and-fee reliance in suburbs and finds a positive relationship, but it is not statistically significant. The null findings for killings of Black people and killings in suburbs is not definitive. The lack of statistical significance could result from smaller sample sizes for these two subgroups. More research is needed to investigate these relationships after more years of data accumulate.

DISCUSSION AND CONCLUSION

The summer of 2020 saw an explosion of protest against police brutality in the United States. The Black Lives Matter movement called attention both to incident-level contributors to police killings such as the racial bias of officers and contextual factors such as police department budgets (Movement for Black Lives 2016; Reclaim the Block 2020). Following the deaths of Michael Brown in Ferguson, Missouri, and of Philando Castile in Falcon Heights, Minnesota, police reform advocates pointed to the suburbs' high issuance of fines and fees as a possible contributing factor in the men's deaths.

This study found that suburbs are the metropolitan type that collects the most in monetary sanctions, making Ferguson and Falcon Heights typical. Suburbs gather 45 percent more of their budget from fines and fees than central cities do. I also found that places with larger Black populations rely more on fine-and-fee revenue, exemplified by the majority-Black Ferguson. Places with 1 percent more Black people collect 1 percent more in monetary sanctions.

Whereas suburbs as a whole collected the most in fine-and-fee revenue, the typical suburb collected only about 2 percent that way. Could such a small percentage be said to represent reliance on fines and fees? Could such a small percentage have any impact on policing? Lawmakers in Ferguson wrote in a 2014 press release that fine-and-fee revenue was such a small part of their budget (7 percent that year) that it could not be responsible for any intensification in the town's policing (U.S. Department of Justice 2015). A year later, however, a Department of Justice investigation found the need for fine-and-fee revenue was hugely influential on the suburb's law enforcement practices, with city officials pressuring police officials and judges to increase monetary sanctions and court fees. Although fine-and-fee revenue was small in percentage terms, it profoundly increased the number of arrests Ferguson police made and citations they issued.

In the highly constrained fiscal environment of post-tax-revolt municipal governance, and in an era when state and federal aid is low and declining, fines and fees are one of the few revenue spigots local governments can open without adopting new legislation or passing politically unpopular tax increases. Thus it assumes an outsized importance in local govern-

Table 3. Unstandardized Regression Coefficients, Fixed-Effects Models

	(1) Police Killings per Million	(2) Police Killings per Million	(3) Police Killings of Black People per Million	(4) Police Killings per Million, Suburbs Only
Fines and fees				
Percent of revenue from fines and fees	0.35*		2.17	0.35
	(0.15)		(1.95)	(0.19)
Fines and fees per capita ($10s)		0.29**		
		(0.10)		
Crime and police characteristics				
Violent crime rate	0.03	0.03	0.21	0.14
	(0.10)	(0.10)	(0.52)	(0.16)
Property crime rate	0.01	0.01	0.32*	−0.01
	(0.02)	(0.02)	(0.14)	(0.03)
Number of police officers	0.02	0.02	−4.19	−0.09
	(0.23)	(0.22)	(3.08)	(0.34)
Municipality characteristics				
Total revenue less fines and fees	0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Percent Black	−0.04	−0.04		−0.11
	(0.10)	(0.09)		(−0.11)
Percent Latino	0.05	0.05	0.68	-0.03
	(0.07)	(0.07)	(0.60)	(0.10)
Percent Asian	−0.13	−0.13	−1.36	-0.05
	(0.10)	(0.10)	(1.46)	(0.14)
Index of economic advantage	0.70	0.70	0.22	0.06
	(0.82)	(0.82)	(6.62)	(1.23)
Percent young men	0.04	0.04	0.42	0.09
	(0.12)	(0.05)	(1.01)	(0.18)
Percent vacant housing units	0.05	0.05	0.10	0.08
	(0.07)	(0.07)	(0.55)	(0.10)
Population (thousands)	−0.01*	−0.01*	−0.05	−0.04
	(0.00)	(0.00)	(0.06)	(0.00)
Constant	1.41	1.63	−10.88	1.39
	(2.54)	(2.53)	(19.10)	(3.71)
N (municipality years)	16,319	16,319	12,390	9,090

Source: Author's calculations based on Fatal Encounters, Census of Governments, Uniform Crime Report, Law Enforcement Officers Killed in Action, and American Community Survey data.
Note: Standard errors in parentheses. Coefficients for the year fixed effects omitted for concision.
*$p < .05$; **$p < .01$; ***$p < .001$

ment behavior. In a survey of municipal officials in Wisconsin, more officials supported adopting or increasing fees and charges than favored raising property taxes in response to fiscal stress (Maher and Deller 2007). Although fine-and-fee revenue is less in absolute terms than property taxes or intergovernmental revenue, its malleability makes it consequential for fiscal planning and policing.

Police advocates might argue that fines and fees are the by-product of crime. Police can issue fines only in response to crimes, so any in-

crease in fine-and-fee revenue is merely the effect of increased criminal behavior, not police seeking revenue. The results of this study contradict this explanation. The number of officers in a municipality is positively related to fine-and-fee revenue but crime rates are not. Indeed, crime is negatively related to fines and fees, perhaps because officers responding to crime do not have time to make the kinds of discretionary stops that lead to the most citations, arrests, and fines. The variable over which local officials have discretion, the number of police officers, is a stronger determinant of fine revenue than crime is, suggesting that it is policymaker and police manager choices—not crime by the public—that drives fine revenue.

My second hypothesis expected that police in suburbs would be responsible for more deaths than police in central cities. The opposite proved true. Suburbs experienced 14 percent fewer police killings than central cities. Police in rural towns were responsible for 38 percent fewer deaths. The difference between metropolitan types underscores that fine-and-fee reliance is not the only factor contributing to police killing frequency. Cities have higher crime rates, more poverty, and more non-White people than suburbs and rural towns, all factors associated with more police killings.

Despite suburbs and cities' absolute differences in police killings, their trends are converging. Suburban police killings rose steadily before 2018 and central city killings fell steadily. Although the unique place characteristics of suburbs like fragmentation and diversification help explain their fine-and-fee collection and their increasing numbers of police killings, their differences with cities do not yet make their police more violent in absolute terms. The higher number of police killings in cities does not mean the deaths of Michael Brown, Philando Castile, and the other victims of police violence in suburbs are any less tragic, but instead indicates that victims such as Eric Garner and George Floyd, who were killed in central cities, are the modal cases.

That the frequency of police killings in suburbs and cities are converging echoes other research showing declining differences between the two metropolitan types. The rates of poverty, eviction, immigration, crime, and misdemeanor arrests in suburbs are increasingly resembling those of central cities (Allard and Pelletier 2023, this issue; Rutan, Hepburn, and Desmond 2023; Walker 2019; Beck 2019; Kneebone 2017). Suburban municipalities are ill prepared for this suburbanization of traditionally urban conditions because governmental and nonprofit social safety nets are weaker in suburbs than cities (Allard 2017; Allard and Pelletier 2023, this issue). Despite converging, important differences between suburbs and cities remain. How governments, nonprofits, and social movements respond to these differences will shape municipal trajectories on both sides of the city limits.

This study found that fine-and-fee reliance, though small in percent terms, is consequential for police killings, confirming the third hypothesis. Municipalities that collect 1 percent more in fines and fees than the typical municipality experienced 4 percent more police killings. This finding from an analysis of between-municipality variation was buttressed by findings from within-municipality analyses, which found that when municipalities increase the proportion of their revenue from fines and fees by 10 percent, there were three and a half more police killings per 1 million residents.

The connection between fine-and-fee reliance and police killings underscores how policing is embedded in municipalities' political economies. Police are part of a municipal government dependent on resources. The findings of this study join a growing body of research showing that government officials and structural incentives encourage police to contribute to their local governments' resource needs.

The results presented here cannot speak to the mechanisms connecting fine-and-fee reliance with police killings, but other research can connect these dots. As police prioritize revenue collection, they make more contacts with the public. Increasing police-public contact will likely increase the number of police killings proportionally, even absent any other changes. Additionally, revenue-motivated policing changes not just the frequency but also the character of police-public interactions. Under pressure to collect money, officers in Fer-

guson came to view residents not as people to serve but as sources of revenue to collect (U.S. Department of Justice 2015). Recipients of fines and fees report that police ignore their humanity and emotions (Pattillo and Kirk 2020; Balko 2014). These results suggest this dehumanization combines with the increased contact and leads officers to more readily use deadly force in more situations.

Although further research is needed and this study's methods reveal relationships rather than causes, the finding of an association between revenue needs and police killings should give policymakers pause. This study suggests that reducing municipalities' fine-and-fee reliance will reduce not only onerous financial burdens for those fined but also the number of people who die after police encounters. This is yet another reason to sharply curtail the use of fines and fees as criminal legal sanctions, and, as the U.S. Commission on Civil Rights recommends to "delink [criminal justice] revenue collection with budget needs of municipalities and courts" (2017).

Each jurisdiction has dozens of different monetary sanctions they will have to unwind, from parole fees to commissary garnishment for court debt (LaScala-Gruenewald, Adamides, and Toback 2020), and eliminating the burdens of those monetary sanctions will not be easy. Because fine-and-fee reliance is often the product of other fiscal constraints, any move away from monetary sanctions will need to be accompanied by increases in tax or intergovernmental revenue.

Many cities and states have reformed their fine-and-fee policies since 2015, including Ferguson. Some places have limited how much municipal budgets can derive from fines and fees, tied fine amounts to the ability to pay, and eliminated tax refund garnishment for unpaid court debt, among other reforms (Fines and Fees Justice Center 2022). To build on these reforms, cities should remove additional sanctions for failure to pay and increase transparency so that those fined have a clear understanding of what they owe (Shannon et al. 2020). In regions with many fragmented suburbs, jurisdictions rarely coordinate to eliminate fines, so even in places that have capped costs, people might have legal entanglements from adjacent municipalities (Huebner and Giuffre 2022). This means true criminal legal reform will need action by state governments or an end to municipal fragmentation. Small municipalities should cooperate or agglomerate to alleviate the confusion, redundancy, and multiple entanglements that afflict many suburban legal systems.

Revenue-motivated policing is deeply embedded in municipal political economies, but the findings of this study make clear the stakes for not delinking policing and revenue. Places that grow their reliance on fines and fees are likely to see a growth in police killings. If we want fewer deaths like those of Michael Brown and Philando Castile, eliminating municipal budgetary reliance on fines and fees is a promising route.

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