

Law Enforcement Leaders and the Racial Composition of Arrests: Evidence from Overlapping Jurisdictions*

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Abstract

Racial discrimination in policing remains at the forefront of policy and research interest. This paper introduces a novel avenue of study by examining the effect of law enforcement leadership on the racial composition of arrests. The analysis is based on a new twenty-five year panel history of the race of each sheriff in the United States linked to agency-level arrest statistics. The primary empirical design exploits the fact that county residents are served by a sheriff and municipal police departments with overlapping jurisdictions, providing within-population controls for contemporaneous changes in the underlying crime rate. The estimates reveal that arrests of blacks relative to whites are higher under a white sheriff than a black sheriff, with the effects primarily driven by arrests for less serious offenses and by smaller sheriffs' offices in rural communities. Further, there is evidence that whites are also less likely to be arrested for predominantly black crimes when there is a black sheriff, suggesting that the targeting of crime types, rather than discrimination at the incident level, is the primary causal mechanism. The analysis contributes to the literature by examining the role of management in a law enforcement context and by developing new methods to identify causal effects and mechanisms.

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1 Introduction

There is a great deal of research and policy interest in the role of race in policing. While an extensive economics literature examines discrimination among law enforcement officers, little is known about the potentially important role of law enforcement leaders who make hiring decisions, establish policing strategies, and provide oversight. To shed light on this question, I estimate the effect of the race of county sheriffs on the racial composition of arrests.¹ Sheriffs provide a compelling context in which to examine the role of law enforcement leaders as their deputies account for one-quarter of all sworn law enforcement personnel in the United States, and because they have a great deal of autonomy in hiring and setting policy. The analysis exploits a new identification strategy based on overlapping jurisdictions and develops a method to shed light on the role of crime targeting as a potential mechanism.

To conduct the analysis, I construct a new panel data set with the race of every sheriff in the U.S. between 1991 and 2015. Identifying race is possible due to the high quality of historical records for sheriffs, and allows an analysis based on within-agency changes in leadership over time. This approach exploits counties that transition from white to black sheriffs, black to white sheriffs, or both. However, addressing potential endogeneity issues is challenging. Years during which a county has a black sheriff may be characterized by differences in demographic composition, economic conditions, racial tension, or unobservable factors that are correlated with the underlying crime rate. To address this issue, I exploit the overlapping jurisdictions of local law enforcement agencies in U.S. counties, which provides within-county counterfactuals for contemporaneous changes in the composition of crimes. Jurisdictions are overlapping in two important ways. First, all residents of a county, including those residing in areas served by a municipal police department, play an equal role in selecting the county sheriff. Thus, in expectation, unobserved characteristics of a population that selects a sheriff of a given race are equally represented across all residents. Second, sheriffs typically have jurisdiction throughout a county, so there is significant overlap in the populations served by police departments and county sheriffs.² As an alternative design, I restrict the sample to affected sheriffs'

¹The negative economic effects of arrests and subsequent incarceration, especially for minorities, are well-documented in the literature. In addition to the mechanical loss of income associated with incarceration, research has examined the effect of arrests and incarceration on subsequent employment (e.g., Grogger, 1992, 1995; Waldfogel, 1994; Western et al., 2001; Holzer et al., 2005; Kling, 2006) and educational attainment (e.g., Hjalmarsson, 2007; Aizer and Doyle, 2015).

²This provides a compelling approach to identification in a context in which the data necessary to implement a regression discontinuity design is rarely available. Specifically, data on the results of county sheriff elections over this 25 year period are poorly maintained relative to elections for more prominent positions and for larger municipalities. Further, data on the race of candidates for sheriff who did not win are rarely maintained or verifiable (especially in the rural communities that comprise the majority of the 1,450 counties in affected states).

offices and exploit the staggered timing of transitions between black and white sheriffs across counties.³

Though sheriffs are a primarily white institution, the panel history reveals 126 counties with a black sheriff and 102 counties that experienced at least one transition between a black and a white sheriff during the 25 year period of interest. These discrete changes in leadership provide sufficient variation to generate precise estimates, and there is no evidence that years during which there is a black sheriff are characterized by differences in demographics or economic conditions. Each law enforcement agency is linked to data with arrests by race and crime type maintained by the FBI's Uniform Crime Reporting Program. The baseline results reveal that years during which a county has a black rather than a white sheriff are associated with a reduction in the arrest rate of blacks relative to whites of 5 to 10 percent. These results are robust to within-county and within-treated agency designs, and to allowing for differential trends for affected and unaffected agencies. Further, they are consistent when measuring the relative difference in arrests using the arrest rate per thousand residents, the natural log of the number of arrests by race, and the ratio of black to total arrests. Heterogeneity analysis reveals that the results are driven primarily by less serious crimes for which there may be greater discretion on the part of law enforcement, and by smaller sheriffs' offices in rural counties where leadership may have greater control over hiring and policing strategies.

To shed light on the mechanism by which law enforcement leaders shape the racial composition of arrests, I introduce a simple model that allows for two potential channels: 1) changing the rate of discrimination exhibited by deputies when pursuing an arrest at the incident level; and 2) altering the extent to which predominantly black crime types are targeted at the agency level. The model reveals natural empirical tests for identifying which mechanisms contribute to the net change in the racial composition of arrests. Specifically, examining the rate at which whites are arrested for predominantly black and predominantly white crime types reveals whether there are shifts in which crimes are targeted under a black or white sheriff. Conversely, examining the arrest rate of blacks for predominantly white crime types can reveal if the race of the sheriff affects the probability of arrest due to discrimination. The estimates reveal that much of the change in the racial composition of arrests is driven by which crime types are targeted when there is a black sheriff. This suggests that analyses focusing solely on whether a specific incident, or type of incident, results in an arrest may overlook the potential for larger changes that stem from higher level policing strategies.

The paper contributes to the literature in several ways. First, it is the first to focus on the role of lead-

³The estimates generated by these two designs are also compared to those from a standard difference-in-differences approach in which affected sheriffs' offices are compared to unaffected sheriffs' offices in the same state that have similar demographics.

ers for shaping law enforcement outcomes. Second, it examines law enforcement in less populous counties rather than restricting attention to large cities. Third, to achieve credible identification, a novel method is developed that exploits overlapping jurisdictions to account for contemporaneous, within-population changes in the underlying crime rate. And fourth, it presents a method to identify if leaders affect the racial composition of arrests through reduced discrimination at the incident level or by targeting different crime types. The estimates are consistent with studies that consider the effect of changing the racial composition of a police force on the racial composition of arrests. Donohue and Levitt (2001), using panel data on the racial composition of metropolitan police departments, find that an increase in the proportion of white officers results in more arrests of minorities (and vice-versa). McCrary (2007) exploits court ordered mandates that increase the fraction of new officers who are black (and thus, over time, changes the composition of the police force) and finds an effect on the racial composition of arrests.⁴ A larger literature has focused on the extent to which police officers exhibit taste-based or statistical discrimination when making the decision to stop and search vehicles (Knowles et al., 2001; Dharmapala and Ross, 2004; Hernandez-Murillo and Knowles, 2004; Anwar and Fang, 2006; Grogger and Ridgeway, 2006; Persico and Todd, 2006; Close and Mason, 2007; Antonovics and Knight, 2009; Sanga, 2009; Hoxby and Rohlfs, 2016), enforce driving infractions (Anbarcia and Leeb, 2014; Horn et al., 2014; West, 2016); stop and frisk pedestrians (Gelman et al., 2007), or use force (Fryer, 2016). The estimates in this study also relate to a literature that considers the effects of managers and political leaders on firm and government policies and performance.⁵

The paper is organized as follows. Section 2 discusses the construction of the panel data set of the race of sheriffs, as well as arrest data and county characteristics. Section 3 presents a simple model that highlights the channels by which law enforcement leaders can shape arrest rates. Section 4 details alternative empirical designs and outcome measures. Section 5 presents the baseline results, heterogeneity analyses, and tests of potential mechanisms. Section 6 concludes and discusses natural extensions.

⁴In contrast to the limited number of studies that consider the effect of the racial composition of a police force, a rich literature estimates the deterrent effects of a larger police force. For example, Levitt (1997) exploits surges in officers during election years, while several recent studies have considered the effects of temporary changes in policing due to terror threats, including Di Tella and Schargrodsky (2004), Klick and Tabarrok (2005), and Draca et al. (2011). Evans and Owens (2007) estimate the effect of being awarded federal grant aid from the COPS program to hire additional officers, while Mello (2017) exploits a change in the program to implement a regression discontinuity design. Chalfin and McCrary (2015) estimate the effect of police on crime while correcting for the measurement error common in police staffing level data. Cook and MacDonald (2011) examine the effect of private security on crime reduction in business districts. For a review of earlier empirical work, see, for example, Levitt and Miles (2006).

⁵For example, studies have considered the theoretical and empirical effects of manager quality and characteristics on the priorities of private firms (e.g., Rotemberg and Saloner, 2000; Bertrand and Schoar, 2003; Van den Steen, 2005), the effect of black managers on hiring (e.g., Giuliano et al., 2009), and the effect of black mayors on hiring and local government policies (e.g., Hopkins and McCabe, 2012; Nye et al., 2014).

2 Sheriffs and Arrest Data

Sheriffs serve in nearly all of the more than 3,100 counties and parishes in the U.S. In most states, sheriffs are the chief law enforcement officer of the county and have jurisdiction in municipalities as well as unincorporated areas.⁶ In practice, sheriffs frequently provide primary patrol in unincorporated areas, incorporated areas that contract for their services (instead of having their own police departments), and incorporated areas when requested. In a number of states, sheriffs have additional responsibilities such as operating the county jail and handling prisoners who must appear in court. Unlike police chiefs, sheriffs have independent offices rather than departments within local government, and thus have autonomy in hiring, allocating resources, and establishing priorities in accordance with each state's laws.

To conduct the analysis, I construct a 25 year panel data set of county sheriffs in the United States. This reveals 126 counties that had at least one black sheriff between 1991 and 2015 and, importantly, 102 counties that experienced at least one transition between a black and white sheriff as presented in Figure 1 (by year) and Table 1 (by state).⁷ Sheriffs are predominantly white, and black sheriffs are only common in counties with a high fraction of black residents. During the period of interest, there was at least one black sheriff in 60 percent of counties in which more than half of the residents were black, there was a black sheriff in 12 percent of counties that were 20 to 50 percent black, and there was a black sheriff in less than 1 percent of counties that were less than 20 percent black.⁸

The data set was constructed largely using publicly available photo directories published by state sheriffs' associations. The availability of data that reveal the race of each sheriff over multiple decades is in contrast to municipal police chiefs who, perhaps as a result of being governed by various local governments rather than state law, do not generally have a highly visible state-level organization. Because the analysis exploits within-county transitions between black and white sheriffs, it is critical to correctly determine the first and last year that each black sheriff served a county and to verify the race of the previous and subsequent

⁶Several states either do not have sheriffs or have sheriffs whose responsibilities are primarily restricted to functions other than regular law enforcement patrol, including Alaska, Connecticut, Delaware, D.C., Hawaii, Massachusetts, Pennsylvania, and Rhode Island. Similarly, sheriffs for counties located in some cities primarily perform court functions rather than patrol (including sheriffs in Virginia's independent cities).

⁷Though there were a number of black sheriffs during Reconstruction, this was followed by a period with essentially no black sheriffs until the late 1960s and the Civil Rights Movement (Foner, 1982; Moore, 1997). Increases after that time, as evident in current levels, have been gradual as black sheriff candidates have struggled to win county elections (Bullock, 1975).

⁸Note that the proportion of black residents in counties tends to be quite stable. For example, among counties that went from having a white sheriff to a black sheriff, the fraction of black residents increased from 41 to 44 percent over the course of 25 years, while the fraction of black residents in counties with the same baseline racial composition but no change in the race of their sheriffs increased from 41 to 43 percent.

sheriffs.⁹ Thus state directories are supplemented with searches of archived news articles to verify the years served by each black sheriff and the race of sheriffs serving before and after. A white to black or black to white sheriff transition is considered verified only if there is print or photographic evidence available to confirm the race of each sheriff. In some cases, one or more black sheriffs served continuously during the sample period and thus there is no transition.

The panel history of sheriffs is linked to agency-level annual arrest data from the Federal Bureau of Investigation Uniform Crime Reporting Program (U.S. DOJ 1991-2015).¹⁰ Not every law enforcement agency reports arrest data in every year. Among sheriffs' offices that ever report arrest data, the average rate of reporting is 22.4 years out of 25. FBI UCR annual arrest totals are reported by crime type, whether the arrestee is an adult or youth, and whether the arrestee is Asian, American Indian, black, or white. The FBI UCR Program classifies the most serious crimes as Part 1 offenses (e.g., murder, assault, larceny, burglary) and less serious crimes as Part 2 offenses (e.g., drug possession, DUI, fraud) as shown in Appendix Table A1.¹¹ This provides a natural distinction for estimating the effect of sheriff transitions on arrests for crimes for which there is likely to be more or less discretion. Each agency is also linked to data on annual officer employment levels collected by the FBI.¹²

Annual estimates of county population by race are merged from Census data in order to construct arrest intensity measures, including arrests of blacks per thousand black residents and arrests of whites per thousand white residents.¹³ Alternative outcome measures presented include the natural log of arrests and the ratio of black arrests to total arrests. While the baseline arrest rate used in the analysis is based on the total population of blacks and whites in each county, estimates are also presented after adjusting the arrest rate to reflect the estimated share of the population served by each law enforcement agency. This share is

⁹The importance of accurately measuring law enforcement as an explanatory variable is highlighted by Chalfin and McCrary (2015), who find that sworn officer levels reported in the UCR data are measured with substantial error and thus attenuate estimates.

¹⁰The Law Enforcement Agency Identifier Crosswalk includes agency codes (Originating Agency Identifier or ORI7) that are used to link agency-level arrest data as well as information about the agency, including the state, county, and whether or not the agency is a sheriff's office, police department, or other law enforcement agency. Note that there are two FBI UCR data reports that break out arrests by race. One is monthly while the other is annual. An examination of these sources reveals that the annual data is less complete, with data missing for some agencies in some years that are included in the monthly reports. Thus the analysis is based on the monthly data reports aggregated to the yearly level.

¹¹Arrests for crimes that are not classified (code 260) appear to be problematic in the data. For example, reporting varies dramatically from year-to-year and has within-county variance that is double that of all other offenses. Thus the baseline estimates are based on arrest totals that exclude unclassified crimes, and the effect of including them is examined in the robustness analysis.

¹²Data on the racial composition of officers is collected once every three years by the U.S. Department of Justice in the LEMAS survey. Unfortunately, only law enforcement offices with at least 100 sworn officers are included in each wave, resulting in data for only 15 sheriffs' offices that experienced a transition in the race of the sheriff.

¹³Note that the people arrested in a county need not be residents in order to contribute to the arrest total. Likewise, residents of the county may be arrested in other counties.

measured using the average number of law enforcement officers employed by each agency during the period of analysis.¹⁴ The analysis also examines if the race of a sheriff affects the type of crimes that are pursued for arrests. Thus I rank crimes based on the fraction of total arrestees for that crime that are black. This reveals which crimes are “predominantly black” and which are not. The details of this classification are discussed in Section 5.3. Census data is also used to construct county-by-year level demographic controls, including the number of residents, the fraction of residents who are American Indian, Asian, black, and white, and average household income.

Table 2 presents summary statistics for counties that experienced a transition and for all counties in the same states. The primary factor unique to affected counties is racial composition: counties that experienced a racial transition are 43 percent black and 54 percent white, while the average for all counties in these states is 22 percent black and 76 percent white. Small counties are also over-represented, as 44 percent of counties with a transition had populations of less than 25,000, exceeding the average of 34 percent. However, counties with transitions are similar to other counties in terms of average income and the black and white arrest rates. The arrest rates by sheriffs’ offices are about 22 arrests of blacks per thousand black residents and 11 arrests of whites per thousand white residents.

3 A Model of Arrests

This section presents a simple model that highlights two potential mechanisms by which law enforcement leaders may generate differential arrest rates across blacks and whites and shows how they can be separately identified. First, taste-based or statistical discrimination can result in a higher arrest rate for blacks at the incident level.¹⁵ Second, law enforcement agencies can target certain types of crimes that may be more common among blacks. The probability of arrest for a crime is a function of the extent to which that crime type is targeted and the probability of arrest conditional on pursuit. We can write the baseline probability of arrest for a white suspect and white crime type as $f(X_i)$, where X_i are the characteristics of the crime. For simplicity, we can write the increased probability of arrest for black suspects and black crime types as

¹⁴The FBI reports an estimate of the population served by each law enforcement agency. However, this population is based on primary jurisdictions and is much less predictive of the number of arrests than is the number of sworn officers in each agency.

¹⁵A large literature has focused on methods to isolate the extent to which discrimination may result in differential arrest rates. One strand of this literature uses aggregate data to conduct outcome tests by which discrimination is inferred from differential “success” rates when officers conduct stops and searches of vehicles or individuals. Another strand attempts to isolate arrest rates for blacks and whites involved in otherwise identical incidents.

scaling factors (with a more general model discussed in the appendix).

$$P(\text{Arrest}_i|B_i, T_i) = f(X_i)(1 + rB_i)(1 + \theta T_i) \quad (1)$$

That is, the probability that a crime results in an arrest depends on whether or not the person committing the offense is black, B , and whether or not the crime is a predominantly black type, T . This paper examines if the race of a sheriff affects the relative arrest rate by altering discrimination toward black suspects, r , or by altering the targeting of black crime types, θ . A sheriff may affect the level of discrimination exhibited by deputies through the hiring process, by implementing different practices, or by otherwise influencing deputy behavior.¹⁶ Alternatively, a sheriff may shape the types of crimes that are targeted by changing the allocation of resources or by instructing deputies to pursue specific types of offenses. For example, a black sheriff could allocate greater resources to pursuing DUI offenses (which are predominantly white) rather than gambling and fraud offenses (which are predominantly black).¹⁷

Separately estimating the effect of sheriff race on arrests for blacks and whites for predominantly black and white crime types sheds light on these two potential mechanisms. Assuming that the arrest rate for whites and white crime types is unaffected by the race of the sheriff (an assumption that is relaxed in the appendix), then the effect of a black sheriff, S , can be written as follows.

$$\frac{dP(\text{Arrest}_i|B_i, T_i)}{dS} = \begin{cases} 0 & \text{if white suspect, white crime type} \\ f(X_i) \frac{d\theta}{dS} & \text{if white suspect, black crime type} \\ f(X_i) \frac{dr}{dS} & \text{if black suspect, white crime type} \\ f(X_i)(1 + \theta) \frac{dr}{dS} + f(X_i)(1 + r) \frac{d\theta}{dS} & \text{if black suspect, black crime type} \end{cases} \quad (2)$$

That is, examining the arrest rate of whites for predominantly black crime types reveals whether black sheriffs reduce the targeting of black crime types. If there is a larger reduction in arrests of whites for predominantly black crime types than predominantly white crime types, it indicates that targeting is a mechanism by which a black sheriff can reduce the relative arrest rate of blacks. In addition, changes in the arrest rate

¹⁶Giuliano et al. (2009) present empirical evidence that black managers are more likely to hire black employees than are managers of other races, while Sharp and Johnson (2009) present cross-sectional evidence that black police chiefs reduce distrust of police among black residents, which is perhaps due to the perception of lower levels of discrimination.

¹⁷Specifically, differences across black and white sheriffs with respect to targeting crime types could stem from taste-based discrimination (e.g., a white sheriff could target gambling offenses because they are primarily committed by blacks), or differing beliefs about the severity of specific offenses (e.g., a black sheriff could be less likely to target gambling offenses because they believe them to be less important).

of blacks for predominantly white crime types should primarily reflect changes in taste-based or statistical discrimination. If this reduction is larger than the reduction for whites for the same crimes, then it suggests this as a possible mechanism. The change in arrests of blacks for predominantly black crime types reflects both changes in discrimination at the incident level and changes in crime targeting.¹⁸

Note that two observable factors may affect the magnitude of the effect of sheriff race on r and θ . First, less serious crimes may involve more subjective decisions by sheriffs and deputies than do serious crimes. This is tested explicitly by separately estimating the effect of sheriff race on the relative arrest rates of blacks and whites for Part 1 and Part 2 crimes. Second, the control a sheriff has over hiring deputies and policing strategies may vary with the number of deputies under their control, so the results are differentiated across larger and smaller offices.

4 Empirical Strategy

This section describes the methods used to estimate the effect of sheriff race on the relative arrest rates of black and white individuals. I present three designs (within-state, within-county, and within-treated) and three measures of the racial composition of arrests (the arrest rate, the natural log of arrests, and the ratio of arrests).

4.1 Alternative Designs

Identification is based on within-agency variation in having a black or white sheriff during the sample period. There are several notable empirical advantages of examining the effects of law enforcement leadership and sheriffs in particular. Specifically, relative to changes in the overall racial composition of police officers in law enforcement agencies, changes in leadership are sudden, easy to measure, and some counties experience multiple transitions.¹⁹ For example, Hardeman County in Tennessee had a black sheriff from 1978 to 1994, a white sheriff from 1995 to 2001, a black sheriff from 2002 to 2010, and a white sheriff from 2011 to 2015.

¹⁸As noted in Donohue and Levitt (2001), the number of crimes committed by blacks and whites could change as a result of changes in law enforcement. That is, the causal mechanism by which there is a reduction in the relative arrest rate of blacks could stem from a causal reduction in the number of crimes committed by blacks when there is a black sheriff. Alternatively, residents may be more or less likely to report crimes as a function of who crimes are reported to (Iyer et al., 2012). However, subsequent analysis reveals that the reduction is driven by the types of crimes committed, so it would need to be the case that blacks and whites respond to a black sheriff by becoming less likely to commit or report predominantly black crime types, rather than through an overall reduction in crime or reporting for blacks relative to whites.

¹⁹Draca et al. (2011) highlight the importance of a significant and well-measured law enforcement shock for generating accurate and relevant point estimates. They also note that estimates based on law enforcement shocks that mirror the policy treatment of interest carry more external validity.

Since 1991, 102 counties have experienced one or more transitions. Further, sheriffs manage independent offices and have a great deal of autonomy in hiring deputies and shaping policing strategies relative to police chiefs who manage police departments and answer to mayors and other local leaders.

The outcome of interest is the relative change in arrests of blacks and whites when there is a black sheriff. Exploiting relative differences in arrest rates is appealing because it accounts for changes in the overall arrest rate that are due to changes in the crime rate common to blacks and whites or that are due to changes in sheriff's office staffing levels. Thus, the identification concern is that years during which a county has a black sheriff may have relatively lower (or higher) black arrest rates due to changes in observable (e.g., racial composition) or unobservable (e.g., changes in the socioeconomic standing of blacks) factors. Figure 2 reveals that transitions between a black and a white sheriff are not associated with changes in the racial composition of residents. Further, Appendix Table A2 presents formal tests showing that years during which a county has a black sheriff are not correlated with observable differences in the racial composition of residents, average income, county population, or number of deputies employed. Nonetheless, it is a serious concern that a population of residents who select a black sheriff may have unobservable characteristics that are correlated with the racial composition of arrests.

The overlapping jurisdictions of local law enforcement in the United States provide a unique opportunity to account for unobservable characteristics of the population. Specifically, counties served by sheriffs are also served by municipal police departments. The jurisdiction of police departments is restricted to the boundaries of the cities, towns, townships, and villages that they serve, while sheriffs generally have authority throughout a county. That is, the population that selected a sheriff is also served by, in most cases, municipal police departments.²⁰ Local law enforcement agency arrest rates are a desirable control for changes driven by unobservable characteristics of the county population for two reasons. First, since all residents of a county are equally responsible for selecting the sheriff, any unobservable characteristics of the population that make them inclined to select a black or white sheriff should be equally evident among those served primarily by the sheriff or by a police department. Second, there is significant overlap in the populations served by sheriffs and municipal police departments. This stems from the fact that sheriffs provide law enforcement within many municipalities and because residents frequently pass in and out of the

²⁰On average there are four police departments reporting arrest data within each county. Nationally, sheriffs account for approximately 24 percent of all law enforcement officers, while municipal police departments account for 60 percent (where the latter is largely driven by large cities). In counties that experience a change in sheriff race, sheriffs' offices account for about half of sworn law enforcement officers and arrests.

small jurisdictional areas served by local law enforcement. Aggregating police department arrest data at the county level provides a counterfactual measure of contemporaneous changes in the underlying composition of crimes within the population of interest.

A natural alternative to this design is to restrict the sample to sheriffs' offices that experienced a transition. Identification is possible due to differences in the timing of when transitions between black and white sheriffs took place. For example, we observe 17 counties switching from a white to a black sheriff between 1991 and 1995, 18 between 1996 and 2000, 16 between 2001 and 2005, 25 between 2006 and 2010, and 26 between 2011 and 2015. This approach is appealing to the extent that treated counties may share unobserved characteristics that are correlated with trends in the composition of arrests.

The results from the within-county and within-treated agency designs are compared to those from a more standard approach that uses untreated sheriffs' offices in the same states to implement a difference-in-differences design. Specifically, a counterfactual is constructed from sheriffs' offices with similar demographics but that did not experience transitions.²¹ A within-state approach accounts for changes in black arrest rates in each year that are common throughout the state, that stem from state policies, or that are particular to the role of sheriffs. However, this approach, unlike the first two, will not account for unobservable factors that may be correlated with switching between a black and a white sheriff.

4.2 Specifications and Outcomes

The paper presents estimates for three alternative measures of the arrest rate for blacks relative to whites.²² First, in the baseline specification, the outcome of interest is the number of arrests of blacks per thousand black county residents while controlling for the white arrest rate. Second, the specification is replicated using the natural log of arrests of blacks while controlling for the natural log of the size of the black population and the natural log of arrests of whites. The resulting estimates reveal the percent change in arrests when there is a black sheriff that is not explained by changes in a county's population or demographic composition. Third, results are presented for changes in the ratio of black arrests to all arrests while controlling for the fraction of the population that is black. This captures changes in the fraction of arrests that are of black people as a

²¹In practice, black sheriffs serve almost exclusively in counties with a high fraction of black residents, and no other county characteristic is predictive of having a black sheriff. Thus, when making within-state comparisons, counties are weighted in accordance with how likely they are to have a black sheriff as a function of their demographic composition. Counties that have a small percentage of black residents receive little weight.

²²A number of outcome measures are used in the literature, including crimes rates, log crime rates, the ratio of stops to arrests, odds ratios, and elasticities of police and crime.

function of the race of the sheriff.

The baseline specification estimates the effect of a black sheriff on the black arrest rate.

$$ArrestRate_{a,c,y}^{Black} = \alpha_a + \alpha_y + \delta X_{c,y} + \gamma ArrestRate_{a,c,y}^{White} + \beta BlackSheriff_{a,y} + \varepsilon_{a,c,y} \quad (3)$$

This paper uses a dummy for having a black sheriff as the indicator of interest, so the coefficient β represents the change in the number of arrests of black people (per thousand black residents) when there is a black sheriff. Estimates are based on within-agency variation over time through the inclusion of agency fixed effects, α_a . As discussed in the previous section, the choice of which law enforcement agencies to include in the sample determines whether the year fixed effects, α_y , appropriately controls for year-to-year variation in arrest rates. The results are presented with and without including demographic and economic controls at the county-by-year level, $X_{c,y}$, which include the fraction of residents of each race, the county population, and average income.²³

Controlling for the white arrest rate reported by the same law enforcement agency accounts for differences over time in the way that crimes are pursued that is common for blacks and whites, differences in the way that arrests are reported, and local crime trends that affect both blacks and whites.²⁴ One concern is that the arrest rate per thousand county residents may be a poor measure when there are several law enforcement agencies operating in the same county. That is, a sheriff may be responsible for policing a modest fraction of all residents when there is a city that is served by a police department. Thus, as an additional exercise, I approximate the share of the county population for which each sheriff is responsible using the agency's average share of sworn officers during the sample period, and then replicate the specification using these adjusted crime rates.

In addition to alternative methods of representing the outcome of interest, several robustness checks are considered. A separate time trend for treated counties is included to allow for the possibility that counties with black sheriffs experience differential trends in the composition of crimes and thus arrests.²⁵ The baseline analysis does not include unclassified offenses for which the reporting appears to be inconsistent across

²³ A number of studies have examined the relationship between socio-economic factors and crime (e.g. Burdett et al., 2004; Lochner, 2004), highlighting the potential benefits of including controls for generating more precise estimates and reducing bias in estimates.

²⁴ Note that the relative magnitude of the black and white arrest rate varies across counties, which reduces the predictive power of the white arrest rate in this specification. To address this issue, the white arrest rate is scaled at the agency level to be equal, on average during the sample period, to the black arrest rate.

²⁵ The inclusion of a separate time trend for treated counties can attenuate the estimates if treatment affects trends. That is, if crime rates rise or fall during the period of treatment as a result of the treatment, this will be partially captured by the time trend and will thus underestimate the effect of treatment.

years, so the specifications are replicated with these offenses included in order to examine how they affect the estimates. Finally, outlier arrest years are identified using the ratio of annual arrests to each agency's mean level of arrests. Results are presented when these values are winsorized at the 5th and 95th percentile to determine if data reporting issues or exceptional arrest years are driving the results.

Several dimensions of heterogeneity are considered that shed light on the underlying mechanisms as highlighted in the empirical model. First, the specification is replicated separately for crimes that are classified as serious (Part 1) and less serious (Part 2). This will reveal if sheriffs have greater capacity to alter the composition of arrests for crimes that are less serious. Second, the sample is split into counties with sheriffs' offices of differing size. Sheriffs with fewer deputies may have greater power to determine who is hired and which crimes are targeted for arrests. Finally, crimes are classified as predominantly black or white and then changes in arrests for each of these types of crimes are estimated for blacks and whites. This exercise reveals if sheriffs alter the composition of arrests by changing the types of crimes that are targeted.

5 Black Sheriffs and the Composition of Arrests

This section examines the effect of sheriff race on the racial composition of arrests. Estimates are presented for within-state, within-county, and within-treated agency designs, with and without controls for demographics and economic conditions, and for alternative measures of the relative arrest rate. The results are differentiated by crime severity and by agency size. To explore potential mechanisms, the analysis examines whether the effects are driven by shifts in the targeting of predominantly black and white crime types. Robustness tests are presented for differential trends, outlier data, and the inclusion of unclassified crimes.

5.1 Black Sheriffs and Relative Arrest Rates

Figure 3 presents graphical evidence of the change in the number of arrests of blacks and whites after a transition from a white sheriff to a black sheriff. Prior to the transition, the trends in arrests for blacks and whites track each other closely. After the transition, arrests of blacks fall relative to whites, revealing the change that is reflected in the estimates generated by each identification design. The estimates presented in Table 3 are consistent with black sheriffs reducing the number of arrests of blacks relative to whites (and vice-versa). The within-county design reveals that, during years in which a black sheriff is in office, there are approximately 1.6 fewer arrests of blacks per one-thousand black county residents. This design controls

for year-to-year variation in the relative arrest rate using law enforcement agencies operating in the same counties. Restricting attention to treated sheriffs' offices and thus exploiting variation in the timing of sheriff race transitions generates a nearly identical estimate of 1.7 fewer arrests. Likewise, estimates based on a comparison to sheriffs' offices in other counties with similar racial compositions results in an estimated reduction of 2.0. That is, each of the three designs generates very similar estimates of the effect of a black sheriff on the racial composition of arrests. The estimated effects sizes correspond to reductions in arrests of blacks relative to whites of 6 to 8 percent. Higher rates of arrest of blacks under a white sheriff are evident in counties that experienced transitions from white to black sheriffs and those that transitioned from black to white sheriffs, as shown in Appendix Table A3.

A potential concern is that years during which a county had a black sheriff may be characterized by changes in demographic or economic conditions that affect the black arrest rate. While the within-county and within-treated agency designs are intended to capture both observable and unobservable changes in the underlying crime rate, Table 3 presents estimates after the inclusion of demographic and economic controls for each county and the number of officers in each agency. This results in slightly larger estimated reductions in the black arrest rate for two of the three designs and modest improvements in precision. A second concern is that the full county populations are used to compute the annual arrest rates when, in practice, sheriffs are one of several law enforcement agencies operating in the county. This could result in some sheriffs' offices having small average arrest rates (e.g. if they are responsible for policing rural areas in a county that has a large city police department). Scaling the populations to reflect each sheriff's share of local law enforcement approximately doubles the arrest rate per thousand.²⁶ Commensurate with this, the estimated effects of a black sheriff based on the revised arrest rates are approximately twice as large (see Appendix Table A4).

The reduction in the relative rate of arrests is confirmed by two alternative methods of measuring the change. A specification based on the natural log of black arrests, while controlling for the natural log of white arrests, results in slightly larger estimated effects (see Appendix Table A5). Specifically, arrests of blacks decrease by 9, 11, and 10 percent under a black sheriff when using within-state, within-county, and the within-treated designs. As shown in Appendix Table A6, the ratio of black arrests to all arrests decreases by 0.020, 0.027, and 0.026 under the three designs, respectively. Translating these ratios into percent changes indicates reductions in black arrests of 8 to 10 percent. The robustness of the results to

²⁶There are several options for measuring a sheriff's share of county law enforcement. The estimates presented are based on the sheriff's share of sworn law enforcement officers. A natural alternative is to use the average share of all arrests in the county during the sample period, which results in similar estimates.

these alternatives indicates that the estimates are not sensitive to how the outcome is measured.

5.2 Heterogeneity by Crime Severity and Agency Size

Of interest is whether the reduction in the black arrest rate is being generated by changes for more or less serious crimes. Sheriffs may have greater discretion about whether or not to allocate resources and pursue arrests for less serious offenses such as stolen property, gambling, and driving under the influence. The estimates in Table 4 reveal that the reduction in the black arrest rate is driven primarily by less serious, Part 2 crimes. The estimated changes for more serious, Part 1 crimes are negative, but are relatively small in magnitude and are not statistically significant for the within-county and within-treated agency designs. By contrast, there is a reduction of approximately 1.1 to 1.3 arrests for less serious crimes per thousand residents.²⁷ The reduction in arrests for less serious offenses is nearly identical across the designs and is large enough in magnitude to explain the majority of the overall reduction in the black arrest rate. Note that this difference by crime severity is not attributable to how common arrests are for these offenses, as the mean rates of arrest are similar.

Sheriffs' offices vary considerably in their size and the number of people they serve. For example, the bottom quartile of offices average less than 9 deputies and serve counties with a median population of less than 13,000 residents. Conversely, the top quartile of offices average more than 100 deputies and serve counties with a median population exceeding 130,000 residents. Sheriffs with smaller offices may have greater ease in shaping law enforcement policies such as targeting specific types of crimes. Likewise, these sheriffs may have greater direct influence on hiring and overseeing deputies. To examine if there is evidence of heterogeneity in this dimension, the sizes of county sheriffs' offices are classified according to the average number of deputies they employ during the sample period. Table 5 reveals a consistent pattern of smaller changes in the racial composition of arrests when a sheriff is in charge of a larger office, and larger reductions when a sheriff is in charge of fewer deputies. Specifically, there is no statistically significant change in the racial composition of arrests for the largest offices, while the changes for the smallest quartile are approximately double those of the middle two quartiles.²⁸ Note that the larger effects are not a function of

²⁷The literature has found similar evidence that the interaction of the race of officers and suspects may be most evident for less serious offenses. For example, Donohue and Levitt (2001) find the strongest effect of the racial composition of a police force on the composition of who is arrested for minor offenses. At the level of individual interactions, Fryer (2016) finds that minorities are more likely to experience the use of force by police, but not for the use of lethal force.

²⁸Replicating this exercise for the within-county design using the natural log of arrests generates reductions of 3, 8, and 15 percent for large, medium, and small offices, respectively. The corresponding black to white arrest ratio estimates are -0.012, -0.015, and -0.053.

having higher mean arrest rates among smaller offices. One caveat to interpretation is that the heterogeneity may be detecting differences stemming from the nature of race or law enforcement in rural communities, rather than the effect of greater influence in smaller offices.

5.3 Targeting Predominantly Black Crime Types

Of particular interest is the mechanism by which sheriffs alter the arrest rate of blacks. Specifically, as modeled in Section 3, a lower black arrest rate will occur if a black sheriff is able to alter the level of discrimination exhibited at the incident level (e.g., by hiring deputies who discriminate less, or altering the decision making of existing deputies), or if a black sheriff implements policies that de-emphasize making arrests for predominantly black crime types. In the aggregate, both of these mechanisms will result in a reduction in the ratio of black to white arrests. However, changing the targeting of black crime types should also reveal itself through lower rates of arrests of whites for these offenses. That is, examining whether there are fewer arrests of whites for predominantly black crime types isolates targeting. Examining whether blacks experience a reduction in arrests for predominantly white crime types sheds light on potential changes in discrimination at the incident level.

Predominantly black crime types are identified by taking the ratio of blacks and whites arrested for each type of crime. Among serious crimes, murder and robbery have high relative rates of black arrests, while manslaughter and arson do not. Among less serious crimes, gambling, non-violent offenses against family, fraud, and vagrancy have high rates of black arrests, while drunkenness and driving under the influence do not.²⁹ The differences across crimes are significant. For example, among all agencies in the sample, 44 percent of arrestees for robbery and 37 percent of arrestees for gambling are black, while 13 percent of manslaughter arrestees and 8 percent of DUI arrestees are black. I classify predominantly black crime types as those that comprise the top half of total crimes in terms of the black to white arrest rate.³⁰

Table 6 examines changes in the arrest rate of whites for predominantly black and white crime types when there is a black sheriff. The top panel reveals a statistically significant reduction in the arrest rate for

²⁹Predominantly black crime types (in order from most to least) include robbery, gambling, offenses against family, murder, vagrancy, fraud, prostitution and vice, weapons crimes, forgery and counterfeiting, embezzlement, stolen property crimes, larceny-theft, aggravated assault, drugs sales and possession, and forcible rape. Predominantly white crime types (in order from most to least) liquor laws, driving under the influence, drunkenness, sex offenses, manslaughter, arson, vandalism, motor vehicle theft, burglary, disorderly conduct, and other assaults.

³⁰The results are robust to alternative methods of classifying predominantly black crime types. For example, the estimates are similar when defining predominantly these crimes as those that comprise the top half in terms of number of crime categories. In practice, crime targeting could take on a number of forms, such as focusing on a smaller number of crimes that are known to be more common among blacks or whites, or by shifting emphasis across a wide range of offenses.

black crime types across each of the three designs. The changes are large in magnitude, averaging a 16 percent reduction relative to the mean arrest rate. In contrast, there is no significant change in the arrest rate for white crime types.³¹ These changes are unlikely to be driven by changes in discrimination at the incident level since discrimination is likely to affect arrest rates across crime types. Thus the estimates support a significant shift of arrests away from predominantly black crime types.

Table 7 presents the change in the relative arrest rates of black people for black and white offenses. The top panel reveals a large and significant reduction in the arrest rates for predominantly black crime types (while controlling for the reduction in the white arrest rate for these crimes documented above), while the bottom panel reveals smaller and insignificant reductions for white crime types. The magnitude of the reductions for black offenses is sufficient to explain nearly all of the change in the overall black arrest rate. Further, the insignificant change in the arrest of blacks for white crime types suggests that the compositional change is not due to reduced discrimination at the incident level, as this would likely be evident regardless of crime type. Thus the effect of the race of a sheriff on which crimes are targeted appears to be the primary explanation for difference in the composition of arrests.

5.4 Robustness

This section examines the robustness of each of the three research designs (within-state, within-county, and within-treated) and each of the three outcome measures (arrest rate, natural log, and ratio) to several potential identification concerns. The most natural concern with the design is that counties that experience a change in the race of their sheriff may experience a different change in the relative arrest rate that is not captured by any of the three control groups. While it is hard to reconcile this with research designs that a) restrict attention to within-county comparisons, and b) restrict attention to treated agencies, we nonetheless replicate the within-state and within-county research designs while allowing for affected and unaffected agencies to have different time trends. The results are presented in Appendix Table A7 and remain negative and statistically significant across each of the designs and outcome measures. Thus differential trends do not appear to be driving the estimates.

Unclassified offenses are not included in the primary analysis. Arrests for these offenses do not appear to be consistently reported across years. For example, a number of sheriffs' offices report 0 offenses in this

³¹ Similar estimates are found when using the natural log of arrests for predominantly black and white crime types. The reduction in arrests of whites for predominantly black crime types is approximately 15 percent, while the change in arrests for white crime types is insignificant.

category in some years and then a large number in another year (without a compensating reduction in reports of other offenses). As a result, these unidentified offenses exhibit within-agency variance over time that is more than double that of all other offenses combined. While these reports seem unreliable, I verify that their inclusion does not fundamentally alter the primary estimates. Appendix Table A8 shows that when they are included, the effects are generally unchanged and nearly all of the estimates remain statistically significant.

Finally, it is a potential concern that outlier years or data mistakes may carry disproportionate weight in the analysis. I examine this issue by identifying years that appear to be relative outliers in terms of the number of reported arrests. Outliers are identified by taking the ratio of arrests (black and white) reported in each year to each agency's average number of arrests during the 25 year period. Those years that have a ratio in the top or bottom 5 percent are then winsorized (i.e. the black and white arrest totals are set to the next highest or lowest year in that agency). The results are presented in Appendix Table A9. This process generates estimates that are nearly identical in magnitude to the unadjusted sample. Taken as whole, these results indicate that the estimates in the analysis are robust to a number of natural checks for the validity of the specification and data quality.

6 Conclusion

Racial bias in policing and how to reduce it is of tremendous public policy and research interest. A rich and interesting literature has focused on estimating if taste-based and statistical discrimination exist among police officers. This paper extends the literature to examine the potentially important role of law enforcement leaders for shaping racial dynamics in policing. Focusing on county sheriffs, who serve over 3,000 counties throughout the country, I find compelling evidence that the race of the sheriff affects the race of arrestees, especially in more rural counties and for less serious offenses. In addition to being the first study to consider the effect of the race of law enforcement leaders on arrest outcomes, the paper presents an innovative method of identification based on the fact that counties are served by multiple law enforcement agencies with overlapping jurisdictions. Specifically, because all county residents select the sheriff, and sheriffs have authority throughout the county, it is possible to construct a within-population counterfactual to account for unobserved factors that may be correlated with the composition of crimes.

Of particular interest is understanding the mechanism by which law enforcement leaders may shape the role of race in policing. To examine this important question, this paper presents a new test based on

separating crimes that most commonly result in the arrest of blacks from those with more equitable arrest rates. Examining arrests of whites for these types of offenses reveals that arrests for predominantly black crime types are more common under a white sheriff. That is, the targeting of crime types appears to be the primary mechanism by which sheriffs alter the composition of arrests. This result highlights that studying the role of race at the incident level, or for a specific class of crimes, may understate the role of race in shaping the aggregate arrest rate of blacks and whites.

The findings in this analysis introduce several potentially fruitful areas for additional research. First, the role of the race of law enforcement leadership in the context of urban police departments is a natural extension. With suitable data, this may take the form of considering whether serving under a black or white chief or sergeant affects how officers make arrests. Second, it highlights the need for additional research into how police departments determine which crimes to target at the aggregate level to fully understand the effect of race on arrest outcomes.

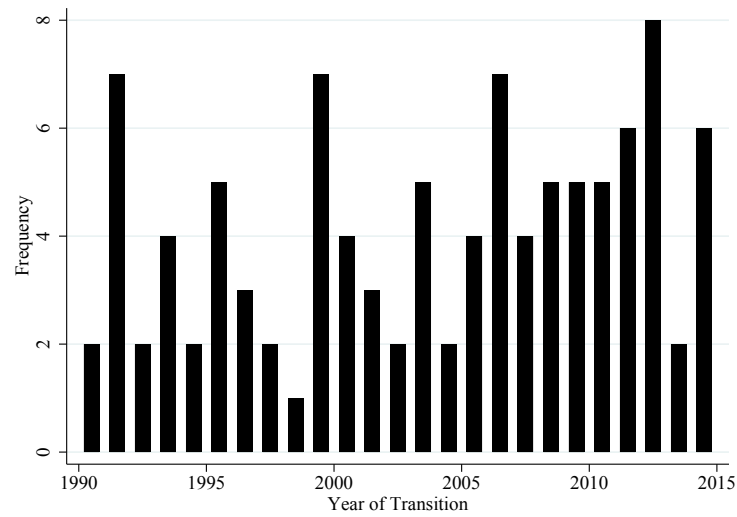
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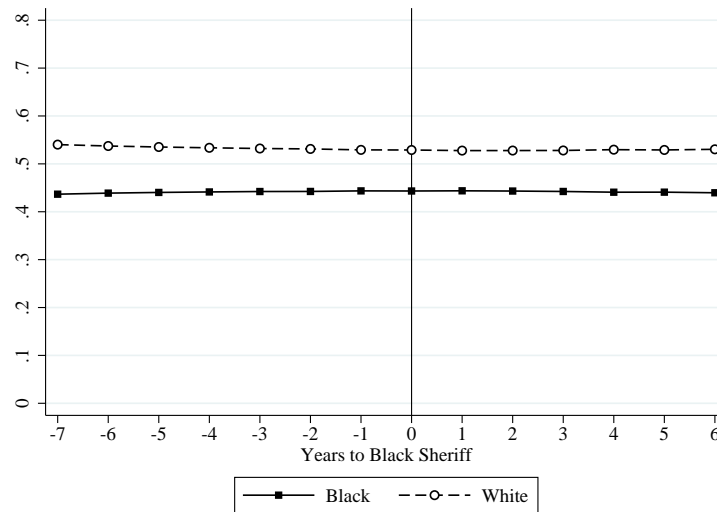
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Figure 1: Number of White to Black Sheriff Transitions: 1991-2015



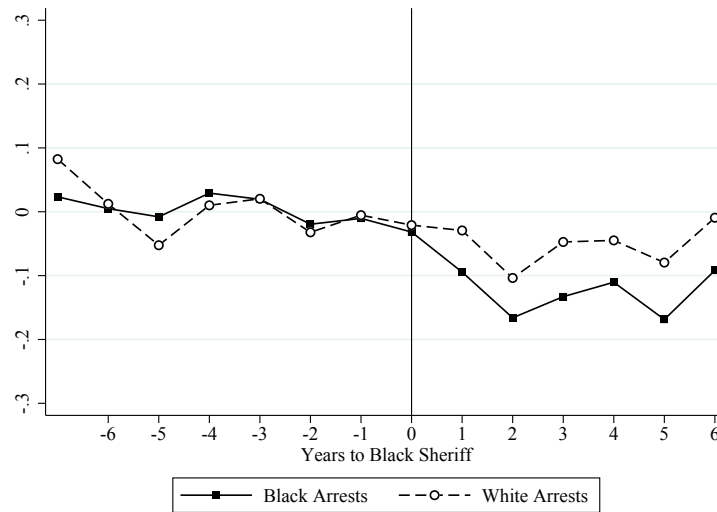
Note: This figure presents the number of counties that experience a transition from having a white sheriff to a black sheriff in each year between 1991 and 2015. Counties that experience multiple white to black transitions are included multiple times. Note that the empirical analysis also includes black to white transitions. The panel history of black sheriffs was constructed from state websites and databases as well as archived newspaper reports.

Figure 2: White to Black Sheriff Transitions: County Demographics



Note: This figure presents the fraction of county residents who are black and white in the years before and after transitions from a white to a black sheriff. Black and white residents account for 97 percent of the population in these counties. Year 0 corresponds to the year of the transition. Note that the empirical analysis also includes black to white transitions. The panel history of black sheriffs was constructed from state websites and databases as well as archived newspaper reports. Data on county demographics comes from the U.S. Census Bureau.

Figure 3: White to Black Sheriff Transitions: Arrests by Race



Note: This figure presents the natural log of arrests of blacks and whites before and after transitions from a white to a black sheriff. The values are normalized to have an average value of 0 in the years prior to the transition. Year 0 corresponds to the year of transition. The panel history of black sheriffs was constructed from state websites and databases as well as archived newspaper reports. Data on agency arrests by race and crime type is from the FBI's Uniform Crime Reporting Program.

Table 1: Counties with Black Sheriffs and Race Transitions Between 1991 and 2015

	Total Counties (1)	Counties With Black Sheriffs (2)	Counties With Transitions (3)
Alabama	67	10	6
Arkansas	75	4	4
Florida	67	3	3
Georgia	159	19	19
Illinois	102	3	3
Indiana	92	2	2
Louisiana	64	5	5
Maryland	24	4	3
Massachusetts	14	2	2
Minnesota	87	1	1
Mississippi	82	19	11
New Jersey	21	1	1
New York	62	1	1
North Carolina	100	17	14
Ohio	88	2	2
South Carolina	46	10	7
Tennessee	95	1	1
Virginia	133	21	16
Wisconsin	72	1	1
Total	1,450	126	102

Note: This table presents the number of counties with black sheriffs between 1991 and 2015. States that did not have a county with a sheriff race transition are excluded from this table and the empirical analysis. Column 1 presents the number of counties in each state. Column 2 presents the number of counties that had a black sheriff in any year during the period of interest. Column 3 presents the number of counties that had both a black and a white sheriff and thus experienced a transition during this period. The panel history of black sheriffs was constructed from state websites and databases as well as archived newspaper reports.

Table 2: Summary Statistics for All Counties and Transition Counties: 1991-2015

	All Counties		Transition Counties	
	Mean (1)	Std Dev (2)	Mean (3)	Std Dev (4)
<i>County Sheriffs</i>				
Fraction Years With Black Sheriff	0.06	0.24	0.42	0.49
Average Number Officers	68.00	99.29	74.51	127.44
Average Civilian Employees	37.81	76.46	36.07	70.21
<i>County Population</i>				
Population 50,000 or more	0.43	0.49	0.36	0.48
Population 25,000 to 50,000	0.24	0.42	0.21	0.40
Population 25,000 or less	0.34	0.47	0.44	0.50
Average Population	91,588	154,882	96,089	198,720
<i>County Demographics</i>				
American Indian	0.01	0.02	0.02	0.05
Asian	0.01	0.02	0.01	0.02
Black	0.22	0.18	0.43	0.17
White	0.76	0.18	0.54	0.17
Average Household Income	43,700	19,920	43,510	21,250
<i>Arrests Per Thousand Black Residents</i>				
All Crimes	22.07	20.26	22.56	17.02
Part 1 Crimes	8.76	9.04	10.21	8.58
Part 2 Crimes	13.32	13.45	12.35	10.35
<i>Arrests Per Thousand Non-Black Residents</i>				
All Crimes	11.27	8.52	11.76	8.47
Part 1 Crimes	4.21	3.36	5.08	4.30
Part 2 Crimes	7.06	6.15	6.68	5.37

Note: This table presents summary statistics about county sheriffs' offices, populations, racial composition, and arrests between 1991 and 2015. Columns 1 and 2 present summary statistics for all counties in states affected by at least one sheriff race transition, while columns 3 and 4 restrict attention to counties that experience a transition. The panel history of black sheriffs was constructed from state websites and databases as well as archived newspaper reports. Data on county populations and demographics comes from the U.S. Census Bureau, Population Division. Data on county earnings comes from the U.S. Bureau of Labor Statistics. Data on agency arrests by race and crime type is from the FBI's Uniform Crime Reporting Program.

Table 3: All Classified Crimes: Arrests Per Thousand Black Residents

	Within State (1)	Within County (2)	Within Treated (3)
<i>Without Demographic Controls</i>			
Black Sheriff	-1.985*** (0.548)	-1.631** (0.596)	-1.719*** (0.554)
R-Squared	.882	.921	.896
Mean Dep	21.062	26.052	22.558
Observations	17,270	2,960	1,511
<i>With Demographic Controls</i>			
Black Sheriff	-1.974*** (0.577)	-1.932*** (0.642)	-1.839*** (0.600)
R-Squared	.884	.926	.900
Mean Dep	21.062	26.052	22.558
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. The top panel presents estimates from a specification that includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents. The bottom panel adds socioeconomic county controls including the fraction of residents of each race, the natural log of the population, the natural log of average household income, and the number of sworn officers in each law enforcement agency. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table 4: Arrests by Crime Severity

	Within State (1)	Within County (2)	Within Treated (3)
<i>Part 1 Crimes (Serious)</i>			
Black Sheriff	-0.855* (0.481)	-0.419 (0.572)	-0.366 (0.433)
R-Squared	.806	.862	.824
Mean Dep	9.087	11.47	10.206
Observations	17,270	2,960	1,511
<i>Part 2 Crimes (Less Serious)</i>			
Black Sheriff	-1.131** (0.450)	-1.212** (0.513)	-1.353** (0.502)
R-Squared	.836	.890	.848
Mean Dep	11.975	14.582	12.352
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents for Part 1 and Part 2 crimes. Crimes are classified according to the FBI's Uniform Crime Reporting Program. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table 5: Heterogeneity By Sheriff's Office Size

	Largest 25%	Middle 50%	Smallest 25%
	(1)	(2)	(3)
<i>Within-State</i>			
Black Sheriff	-0.309 (0.872)	-1.664* (0.861)	-3.260** (1.189)
R-Squared	.951	.869	.817
Mean Dep	21.062	24.707	24.972
Observations	4,472	8,458	4,340
<i>Within-County</i>			
Black Sheriff	0.842 (1.726)	-1.854** (0.876)	-3.915*** (1.284)
R-Squared	.956	.874	.829
Mean Dep	26.052	21.469	18.504
Observations	734	1,454	772
<i>Within-Treated</i>			
Black Sheriff	-0.151 (1.033)	-1.568* (0.799)	-2.437** (1.100)
R-Squared	.954	.869	.819
Mean Dep	22.558	22.962	21.316
Observations	368	739	404

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents for sheriffs' offices of varying sizes. Office sizes are measured by the average number of deputies employed during the sample period. Column 1 includes the largest quartile of offices, while columns 2 and 3 present the middle two quartiles and the bottom quartile, respectively. The top panel includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. The middle panel includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. The bottom panel restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table 6: Arrests of Whites for Predominantly Black and White Crime Types

	Within State (1)	Within County (2)	Within Treated (3)
<i>Predominantly Black Crime Types</i>			
Black Sheriff	-0.933** (0.401)	-0.885** (0.395)	-0.805* (0.393)
R-Squared	.593	.708	.658
Mean Dep	5.18	4.694	5.394
Observations	17,270	2,960	1,511
<i>Predominantly White Crime Types</i>			
Black Sheriff	-0.117 (0.390)	0.342 (0.441)	-0.227 (0.379)
R-Squared	.657	.709	.673
Mean Dep	6.009	6.178	6.283
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand white residents for predominantly black and white crime types. The top panel presents estimates for predominantly black crime types while the bottom panel presents estimates for predominantly white crime types. Each crime type is classified by the ratio of arrests of black to white people across all law enforcement agencies. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, and year fixed effects. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table 7: Arrests of Blacks for Predominantly Black and White Crime Types

	Within State (1)	Within County (2)	Within Treated (3)
<i>Predominantly Black Crime Types</i>			
Black Sheriff	-1.394*** (0.371)	-1.748*** (0.423)	-1.205*** (0.416)
R-Squared	.816	.888	.839
Mean Dep	11.196	13.037	11.839
Observations	17,270	2,960	1,511
<i>Predominantly White Crime Types</i>			
Black Sheriff	-0.613 (0.466)	0.016 (0.550)	-0.503 (0.447)
R-Squared	.815	.879	.827
Mean Dep	9.762	12.732	10.582
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents for predominantly black and white crime types. The top panel presents estimates for predominantly black crime types while the bottom panel presents estimates for predominantly white crime types. Each crime type is classified by the ratio of arrests of black to white people across all law enforcement agencies. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Appendix

A Testing Mechanisms: Discrimination and Crime Type Targeting

Section 3 of the paper proposes a simple model in which the probability of arrest depends on both the extent to which blacks face racism in arrest decisions and the extent to which black crime types are targeted by law enforcement agencies. This section discusses what can be concluded about the mechanism with a more general model and weaker assumptions.

The probability of pursuing an arrest for a crime type is expressed as $g(T, S)$ and depends on both the race of the sheriff S and whether the crime type T is predominantly committed by blacks. The probability of arrest conditional on an arrest being pursued is expressed as $f(O, S)$, and depends on both the race of the offender and the race of the sheriff. The probability of an arrest is the product of the probability of pursuing an arrest and the probability of an arrest conditional on pursuit: $P(Arrest) = g(T, S) * f(O, S)$. As in Section 3, I examine what can be identified about which of these two components is the primary mechanism by estimating the effect of having a black sheriff on arrests of blacks and whites for black and white crime types.

$$\frac{dP(Arrest_i)}{dS} = \frac{dg(T, S)}{dS} * f(O, S) + \frac{df(O, S)}{dS} * g(T, S) \quad (4)$$

First, consider the case of arrests of white people for the two types of crimes. Under the assumption that there cannot be less discrimination toward whites under a black sheriff, or less targeting of white crime types, then finding no effect of a black sheriff on arrests of whites for white crime types suggests no change through either mechanism. However, a positive effect would leave open the possibility that discrimination toward whites increases under a black sheriff. In the latter case, a change in arrests of whites for black crime types could be biased upward as it would capture this discrimination. In practice, the estimates suggest an insignificant effect for whites being arrested for white crime types, which simplifies the interpretation of changes in arrests for black crime types.

Now consider white offenders arrested for predominantly black crime types. Under the assumption that there will not be less discrimination toward white offenders with a black sheriff (i.e. $\frac{df(white, S)}{dS} \geq 0$), then a negative effect implies that black sheriffs are less likely to target arrests for black crime types. Note that the effect for white crime types can provide evidence for the assumption that a black sheriff has a null or positive effect on discrimination toward white offenders. That is, if black sheriffs have a null or positive effect on discrimination toward white offenders. That is, if black sheriffs have a null or positive effect on white crime types, then the negative effect on black crime types is almost certainly driven by a

reduction in the extent to which these sheriffs target arrests for black crime types. Thus, examining the effect of a black sheriff on arrests of whites for predominantly black and white crimes is informative about the mechanism driving observed changes in arrests of blacks.

For black offenders being arrested for black crimes, a negative effect could be generated by reduced discrimination or reduced targeting of black crime types. Under the assumption that a black sheriff does not increase discrimination or increase targeting, then a null effect suggests that neither has changed. More interestingly, for white crime types, a negative effect reveals a reduction in discrimination towards blacks under the assumption that black sheriffs do not reduce the targeting of white crime types. Note that the effects for white offenders can provide compelling evidence about whether black sheriffs target white crime types. That is, if black sheriffs have a null or positive effect on white crime types for white offenders, then a negative effect on white crime types for black offenders is likely to be driven by reduced discrimination. Thus, examining the effect of a black sheriff on arrests of blacks for predominantly white crime types can be informative about the mechanism driving changes in arrests of black offenders.

Table A1: Distribution of Arrests: Part 1 and Part 2 Crimes

Crime	Percent
<i>Part 1</i>	
Murder and manslaughter	0.23
Forcible rape	0.36
Robbery	0.74
Aggravated assault	5.64
Burglary	4.25
Larceny-theft	8.93
Motor vehicle theft	1.20
Other assaults	14.49
Arson	0.20
<i>Part 2</i>	
Forgery and counterfeiting	1.14
Fraud	7.16
Embezzlement	0.16
Stolen property crimes	1.31
Vandalism	2.63
Weapons crimes	1.72
Prostitution and vice	0.18
Sex offenses	1.07
Drugs-sale, possession	15.96
Gambling	0.07
Offenses against family	3.53
Driving under the influence	14.27
Liquor laws	5.08
Drunkenness	5.26
Disorderly conduct	4.29
Vagrancy	0.14

Note: This table presents a list of Part 1 and Part 2 crimes as classified by the FBI's Uniform Crime Reporting Program. Part 1 crimes are considered more serious and Part 2 crimes are considered less serious. Each local law enforcement agency reports data on the number of arrests for crimes of each type. The second column presents the percent of all arrests that are made for each crime type, with approximately 30 percent of arrests occurring for Part 1 crimes and 70 percent for Part 2 crimes.

Table A2: Sheriff Race and Changes in Covariates

	Fraction Am. Ind. (1)	Fraction Asian (2)	Fraction Black (3)	Fraction White (4)	Log Income (5)	Log Population (6)	Log Officers (7)
<i>Within-State Specification</i>							
Black Sheriff	-0.000 (0.001)	0.001 (0.001)	0.001 (0.005)	-0.001 (0.005)	0.001 (0.006)	0.011 (0.016)	-0.027 (0.025)
Mean Dep	.01	.009	.433	.549	10.556	10.375	3.487
<i>Within-Treated Specification</i>							
Black Sheriff	-0.000 (0.001)	-0.000 (0.001)	-0.003 (0.005)	0.004 (0.006)	-0.002 (0.006)	-0.002 (0.015)	-0.032 (0.025)
Mean Dep	.015	.011	.433	.541	10.569	10.473	3.592

Note: This table presents tests for whether or not years during which a county has a black sheriff differ from other years in terms of demographic composition, average income, population size, or number of deputies. The primary specification is replicated with each socio-economic characteristic as an outcome. The top panel presents the specification for sheriffs within the same state, while the bottom panel includes only treated counties over time. Note that characteristics are measured at the county level, so the within-county specification is not included. Each specification includes agency fixed effects and fixed effects for each year. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A3: Arrest Rates: White to Black and Black to White Transitions

	Within State (1)	Within County (2)	Within Treated (3)
<i>White to Black Transitions</i>			
Black Sheriff	-1.951*** (0.567)	-1.569** (0.614)	-1.622** (0.583)
All Crimes	0.810*** (0.026)	0.791*** (0.059)	0.760*** (0.048)
R-Squared	.882	.922	.898
Mean Dep	21.062	26.052	22.558
Observations	17,224	2,865	1,465
<i>Black to White Transitions</i>			
Black Sheriff	-1.455** (0.599)	-1.269* (0.667)	-1.708** (0.663)
All Crimes	0.843*** (0.024)	0.960*** (0.107)	0.790*** (0.110)
R-Squared	.882	.92	.933
Mean Dep	21.062	26.052	22.558
Observations	16,044	567	285

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents. The top panel presents estimates when restricting attention to treated counties that experienced a transition from a white sheriff to a black sheriff. The bottom panel presents estimates when restricting attention to treated counties that experienced a transition from a black sheriff to a white sheriff. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A4: Arrest Rates: Jurisdiction Adjusted Estimates

	Within State (1)	Within County (2)	Within Treated (3)
Black Sheriff	-2.671** (1.218)	-2.792** (1.313)	-3.246** (1.223)
R-Squared	.837	.875	.854
Mean Dep	42.291	47.835	42.67
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the number of arrests per one thousand black residents. The population of black and white residents is adjusted to reflect each law enforcement agencies share of officers in the county during the sample period. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. The specification includes agency fixed effects, year fixed effects, the agency arrest rate per thousand white residents, and demographic controls. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A5: All Classified Crimes: Natural Log of Black Arrests

	Within State (1)	Within County (2)	Within Treated (3)
<i>Without Demographic Controls</i>			
Black Sheriff	-0.093*** (0.031)	-0.108*** (0.034)	-0.102*** (0.031)
R-Squared	.951	.962	.959
Mean Dep	5.217	5.525	5.426
Observations	17,270	2,960	1,511
<i>With Demographic Controls</i>			
Black Sheriff	-0.090*** (0.027)	-0.117*** (0.032)	-0.098*** (0.027)
R-Squared	.954	.965	.963
Mean Dep	5.217	5.525	5.426
Observations	17,270	2,960	1,511

Note: This table presents estimates of the effect of a black county sheriff on the natural log of the number of arrests of black people. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 restricts attention to treated counties that experienced a sheriff race transition during the sample period. Column 3 adds municipal police departments that operate in counties that had at least one black sheriff. The top panel presents the estimates from a specification that includes agency fixed effects, year fixed effects, and the natural log of the arrests of whites by the agency. The bottom panel adds socioeconomic county controls including the fraction of residents of each race, the natural log of the population, the natural log of average household income, and the number of sworn officers in each law enforcement agency. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A6: All Classified Crimes: Ratio of Black to All Arrests

	Within State (1)	Within County (2)	Within Treated (3)
<i>Without Demographic Controls</i>			
Black Sheriff	-0.020** (0.008)	-0.027*** (0.008)	-0.026*** (0.008)
R-Squared	.844	.833	.871
Mean Dep	.555	.593	.569
Observations	17,174	2,954	1,508
<i>With Demographic Controls</i>			
Black Sheriff	-0.021*** (0.007)	-0.029*** (0.008)	-0.027*** (0.008)
R-Squared	.846	.837	.875
Mean Dep	.555	.593	.569
Observations	17,174	2,954	1,508

Note: This table presents estimates of the effect of a black county sheriff on the ratio of black arrests to total arrests. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. The top panel presents the estimates from a specification that includes agency fixed effects, year fixed effects, and the fraction of residents that are black. The bottom panel adds socioeconomic county controls including the fraction of residents of each race, the natural log of the population, the natural log of average household income, and the number of sworn officers in each law enforcement agency. Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A7: Differential Time Trends

	Within State (1)	Within County (2)	Within Treated (3)
<i>Arrests Per Thousand Black Residents</i>			
Black Sheriff	-1.578*** (0.545)	-1.702*** (0.543)	-1.642*** (0.539)
R-Squared	.882	.921	.894
Mean Dep	21.062	26.052	22.558
Observations	17,270	2,960	1,511
<i>Natural Log of Black Arrests</i>			
Black Sheriff	-0.100*** (0.032)	-0.105*** (0.035)	-0.098*** (0.030)
R-Squared	.951	.962	.959
Mean Dep	21.062	26.052	22.558
Observations	17,270	2,960	1,511
<i>Ratio of Black to All Arrests</i>			
Black Sheriff	-0.026*** (0.008)	-0.027*** (0.008)	-0.026*** (0.008)
R-Squared	.844	.833	.871
Mean Dep	.555	.593	.569
Observations	17,174	2,954	1,508

Note: This table presents estimates of the effect of a black county sheriff on black arrests while controlling for a separate time trend for law enforcement agencies that are and are not affected by transitions. The top panel presents arrests per one thousand black residents, the middle panel presents the natural log of the number of arrests, and the bottom panel presents the ratio of black arrests to all arrests. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents (top panel) or natural log of arrests of whites (bottom panel). Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A8: Including Unclassified Offenses

	Within State (1)	Within County (2)	Within Treated (3)
<i>Arrests Per Thousand Black Residents</i>			
Black Sheriff	-1.653** (0.762)	-1.423* (0.826)	-0.940 (0.783)
R-Squared	.9	.922	.906
Mean Dep	31.535	36.527	33.494
Observations	17,270	2,960	1,511
<i>Natural Log of Black Arrests</i>			
Black Sheriff	-0.069** (0.031)	-0.084** (0.035)	-0.076** (0.032)
R-Squared	.957	.964	.965
Mean Dep	5.591	5.827	5.778
Observations	17,270	2,960	1,511
<i>Ratio of Black to All Arrests</i>			
Black Sheriff	-0.017** (0.007)	-0.023*** (0.008)	-0.023*** (0.008)
R-Squared	.865	.843	.884
Mean Dep	.568	.602	.581
Observations	17,174	2,954	1,508

Note: This table presents estimates of the effect of a black county sheriff on black arrests while including “other” unclassified offenses. The top panel presents arrests per one thousand black residents, the middle panel presents the natural log of the number of arrests, and the bottom panel presents the ratio of black arrests to all arrests. Column 1 includes county sheriffs’ offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs’ offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs’ offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents (top panel) or natural log of arrests of whites (bottom panel). Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.

Table A9: Winsorizing at the 5th and 95th Percentile

	Within State (1)	Within County (2)	Within Treated (3)
<i>Arrests Per Thousand Black Residents</i>			
Black Sheriff	-2.128*** (0.542)	-1.709*** (0.581)	-1.851*** (0.543)
R-Squared	.883	.923	.897
Mean Dep	20.981	25.982	22.499
Observations	17,270	2,960	1,511
<i>Natural Log of Black Arrests</i>			
Black Sheriff	-0.096*** (0.031)	-0.112*** (0.035)	-0.105*** (0.030)
R-Squared	.953	.962	.96
Mean Dep	5.225	5.529	5.434
Observations	17,270	2,960	1,511
<i>Ratio of Black to All Arrests</i>			
Black Sheriff	-0.020** (0.008)	-0.028*** (0.009)	-0.026*** (0.008)
R-Squared	.854	.834	.883
Mean Dep	.555	.592	.569
Observations	17,193	2,958	1,511

Note: This table presents estimates of the effect of a black county sheriff on arrest rates after winsorizing the top and bottom 5 percent of the data. Outlier data is identified as the ratio of annual arrests relative to agency means. The top panel presents arrests per one thousand black residents, the middle panel presents the natural log of the number of arrests, and the bottom panel presents the ratio of black arrests to all arrests. Column 1 includes county sheriffs' offices in states that had at least one county sheriff transition between 1991 and 2015. Unaffected counties are weighted by their probability of having experienced a transition. Column 2 includes sheriffs' offices and municipal police departments operating in counties that experienced a sheriff race transition during the sample period. Column 3 restricts attention to treated sheriffs' offices. Each specification includes agency fixed effects, year fixed effects, and the agency arrest rate per thousand white residents (top panel) or natural log of arrests of whites (bottom panel). Errors are clustered at the law enforcement agency and year level. The symbols *, **, and *** represent statistical significance at 10, 5, and 1 percent, respectively.