Does Oversight Reduce Policing? Evidence from the Cincinnati Police Department After the April 2001 Riot

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Abstract

Oversight of a bureaucracy induces its agents to yield to consumers' demands excessively. Oversight is initiated by consumers' complaints when they are wrongly denied the resource under allocation. This paper tests this prediction in a police setting. A riot erupted in Cincinnati after a white officer shot dead an unarmed African-American male in April 2001. The sharply increased media attention and an ensuing federal investigation provided exogenous variation in oversight. Compared to the period from January 1999 to March 2001, arrests during the remaining period of 2001 fell substantially. The decline was more significant for offenses where police officers had more discretion. Communities with a higher percentage of African-Americans

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experienced greater arrest reductions. Felony crime (violent crime and property crime) surged during the same period.

1 Introduction

Many aspects of our lives are served by the public sector, and providing incentives to employees in the public sector (bureaucrats) is a real challenge.[1] One player can potentially help: the public, since bureaucrats serve the public, who can then provide feedback on the bureaucrats' performance. The media, or interest groups, or constituents file a complaint, an investigation is initiated, and if the bureaucrat is found guilty, a punishment is imposed. The consumer feedback thus performs a disciplining function. There is one salient problem with this ex-post oversight, though, argued (Hopenhayn and Lohmann 1996) and Prendergast (2002).[2] Eligible consumers complain when they are wrongfully denied the good under allocation but ineligibles do not utter a word when they are wrongly granted the good. Consumers' complaints and the ensuing investigation and punishment, thus, induce agents to capitulate to consumers' demands excessively.[3] Despite the theoretical interest of this argument, little empirical work seeks to test this theory. This paper intends to fill the gap in providing empirical evidence, in the context of police officers' behavior.

Policing is a good setting to illustrate the effect of the inherent asymmetry in consumer

[1] Specifying structure, procedure, and monitoring agents in an ongoing fashion is costly (Bawn 1997, Lupia and McCubbins 1994). Relying on output is constrained by multi-task concerns (Dixit (2002). Introducing time, Dewatripont, Jewitt, and Tirole (1999) examine the career-concern in bureaucracies but found it insufficient.

[2] For example, granting permission to market a unsafe drug will generate a deluge of consumer complaints, while denying permission to market a drug that can cure diseases is less likely to invite pointed criticism They use this to explain the observed over-conservatism in regulatory agencies.

[3] Prendergast (2003) went further to show that this is the economic rationale for the observed unresponsiveness of bureaucracy.

feedback on officers' behavior. The primary aspect of police officers' job is to arrest suspects and protect the innocent. Yet consumer complaints are inherently one-sided: wrongly arrested innocent people or inappropriately treated offenders complain, while erroneously let-gone criminals would never utter a word, and further, the public can hardly bring their complaint of not controlling crime against an individual officer. While more careful policing may reduce the frequency of an error and thus a complaint, it is difficult and imposes extra costs on a police officer (for example, the officer may risk losing his life for not responding in time to a threat). Less aggressive policing on the part of the officer, which is hard to detect by the superiors, translates automatically into a reduced number of possible accidents. Policing thus decreases when expected cost of punishment for a wrongful arrest or death increases: either the probability of complaints arising becomes greater, or the punishment increases.

This paper uses the events surrounding the April 2001 Cincinnati riot as a natural experiment. On March 14, 2001, the American Civil Liberty Union (ACLU) and the Cincinnati Black United Front filed a class action lawsuit in federal court alleging Cincinnati police and the city had mistreated and "racially profiled" African-Americans for years.[4] On April 7, 2001, Officer Roach, a white male, shot dead an unarmed 18 year old African-American male who was fleeing arrest on 14 misdemeanor warrants, mostly minor traffic violations. A three-day riot erupted during the week after the deadly shooting. The riot caused heavy media attention to the Cincinnati Police Department (CPD). In May, the judge presiding over the profiling case ruled, instead of finding one party guilty or innocent, that involved parties hammer out an agreement to improve police community relations, and that the parties would go to trial if they fail to reach an agreement. At

[4]The lawsuit is keyed to a November 2000 death of Owensby Jr., an African-American, in police custody. More details on this in Section 2.

the request of the mayor, the Department of Justice (DOJ) began a civil right investigation of the department in May 2001, which looked for excessive use of force. In the same month, Officer Roach was indicted.

All of these events surrounding the riot caused an increase in cost of policing. First, the media attention would magnify any potential error in a wrongful death or arrest or stop, and bring undesirable exposure. Second, the DOJ was conducting investigation of the CPD's practices and procedures and recommending changes based on their findings. Any adverse event would result in too stringent recommended changes. Third, any adverse event would worsen the bargaining position of CPD in settling the profiling lawsuit, resulting in unfavorable clauses on their part. Lastly, an indictment of officer Roach served as a refresher of the agony of going through the criminal justice system.[5]

A number of empirical facts support the existence and magnitude of the incentive-reducing impact of the heightened price of policing. First, examining incident level data on felony arrests and misdemeanor arrests from January 1999 to November 2001, I find that monthly felony arrests changed little and misdemeanor arrests decreased substantially after April 2001. Second, the decrease in arrests was greater for those types of offenses where officers had more discretion. For example, arrests for drug- and drinking-related violations saw drops of 44 and 72 percent, respectively, while arrests for domestic violence, where victims call officers for help and officers have to respond, changed little.

Third, a more formal panel analysis shows that a higher percentage of African-Americans in a community is strongly linked to greater arrest reductions (both in level and in percentage term) after the riot. An officer carrying out his or her activities in a black community had more

[5] He was later exonerated from the two charges in October 2001.

chances of being accused of "racial profiling" and would have become more reluctant about policing in a period of intense outside scrutiny. According to my difference-in-difference estimates shown in Table 3, a community at the 75th percentile of African-American percentage experienced an additional 33.5 percent decrease in the monthly arrest rate relative to a community at the 25 percentile.

A leading class of alternative explanation of the above findings is that there was an intentional slowdown organized by the union in response to the lawsuits alleging the city and the police department of racial profiling and oppression. While this is probably part of what was going on, four pieces of evidence suggest that this was not all. First, anecdotal evidence exists that officers were taking tests to apply for jobs in suburbs, suggesting that offices found their compensation package not worth the risk that they took in their working environments. Second, compared to the media blitz and the Justice Dept. investigation, the racial profiling lawsuit was probably more likely to elicit a police "retaliatory" response. The window between November 2000 and March 2001 thus allows me to control for the effect of "intentional slowdown," and one sees the extra de-motivating effect of the media blitz and federal investigation.[6]

Finally, concern over a strategic slowdown is less warranted after all parties–the plaintiff, the police union, the city, and the DOJ–reached agreement in April of 2002.[7] The post-agreement period, compared to the pre-lawsuit period, constitutes an environment for officers where they are subject to a greater probability of investigation, yet is free from the concern of concerted slowdown in a bargaining situation. Arrests did recover from 2001, suggesting part of the arrest drop was

[6] Of course, this control is inadequate if one believes that police officers engaged a more severe slowdown while negotiating terms during the post-riot period.

[7] The Agreement asked for three major revisions of police practice and procedures: use of force policy, review of citizen's complaints, and community based policing.

probably because of intentional slowdown before an agreement was reached. The period after April 2002 and before Dec 2004 witnessed less arrests compared to the pre-lawsuit period (November 2000), confirming the basic message that less policing occurs in an environment where officers are more susceptible to complaints.

Crime surged during the remaining months of 2001. First, monthly felony crime increased by 14 percent after the riot. Moreover, the increase was greater for violent crime–murder, rape, robbery, and aggravated assault. Finally, communities with a higher percentage of African-Americans experienced a greater increase in violent crime relative to other communities after the riot.

Evidence of officers' arrests and citations suggest that officers at the CPD cut down their crime-fighting policing when their costs of policing increased in a period of great scrutiny among events of lawsuit, federal investigation, media attention, and indictments. Thus, this article lends empirical support to the predictions of Hopenhayn and Lohmann (1996) and Prendergast (2002) and supported Prendergast (2004)'s observation that there is an economic rationale for unresponsiveness in public bureaucracy.

This paper has its limitations. It lacks the data to assess the claim that there was discrimination in officers' arrests before the riot. Neither can I evaluate whether the discrimination, if it existed, abated after the interventions. What this paper is able to show is how an increased cost of arresting the wrong person leads to a reduced number of arrests, and an increase in crime.

The closest paper is Prendergast (2002), which used an exogenous variation in intensity in the Los Angeles Police Department. This paper differs from and relates to Prendergast (2001) in several ways. First, this paper uses different variations. Prendergast (2001) uses changes in procedures in the Los Angeles Police Department that have increased the ability of consumers to complain against officers. I utilize increases in scrutiny (media attention and a federal investigation)

after a dramatic event. But in essence, both papers exploit changes that result in an asymmetric attention to officers' activities: increasing the oversight of officers' arresting behavior without changing the penalty for letting loose true offenders. Second, this data set has variations across types of offenses and communities, which allow me to obtain difference-in-differences estimators as well as before-after estimators.

This paper is also intricately related to the multi-tasking and dysfunctional response literature (Holmstrom and Milgrom 1992). The dysfunctional part refers to the fact that when pressure from consumer complaints and the induced oversight mounts, police officers do not respond by being more discreet in arresting, but by de-policing, which hurts the other important aspect of their job–arresting the offenders.

Finally, by examining the consequences of de-policing on crime, this paper is naturally linked to the literature on policing and crime (Di Tella and Schargrodsky 2004, McCrary 2002, Levitt 1997). Previous literature tries to quantify the effect of the number of police officers on crime. This paper highlights the importance of officers' effort and incentives to police.

The structure of the paper is as follows. Section 2 provides a brief account of the event. Section 3 presents the basic empirical evidence that officers reduced their arrests and citations. Section 4 examines changes in felony crime. Section 5 concludes.

2 The Events and the Source of Identification

2.1 Background of Tensions

Cincinnati is a city of 343,000 population, of which 40 percent is black. Between February of 1995 and October of 2001, 13 black males under the age of 40 were killed by police. No whites were

killed in that same time period. Police reports reflect the fact, which usually goes unmentioned, that most of the 13 victims had weapons and that several had first attacked police officers.

On November 7, 2000, Roger Owensby, Jr., a 29 year-old African-American male, died while in the back of a police cruiser after being restrained. On November 13, 2000, the U.S. Department of Justice launched a preliminary investigation into the death. On December 4, 2000, The Hamilton County Coroner's Office found that Owensby died either from a chokehold or from officers piling on top of him. On January 3, 2001, one of the involved officers was charged with felony involuntary manslaughter and misdemeanor assault, and another officer was charged with misdemeanor assault.

On January 13, the Cincinnati Black United Front (BUF), a grass-roots organization, hosted meetings for African-Americans to register their stories of racial profiling by police in an effort to build a class-action lawsuit. On March 14, 2001, the American Civil Liberty Union (ACLU) and the Cincinnati BUF filed a lawsuit in federal court alleging the Cincinnati police had mistreated and racially profiled African-Americans for years. On March 28, Cincinnati City Council passed a racial profiling law, which required that officers record details of every traffic stop they make.

2.2 The Cincinnati Riot

On April 7, 2001, Timothy Thomas ran from police down a dark alley, and was fatally shot by a white police officer Steve Roach. Timothy, an unarmed African-American adolescent, had 14 misdemeanor charges, which led to a warrant for his arrest.[8] Timothy Thomas became the 15th black male to have died in confrontations with police or while in police custody since 1995. This incident occurred while the trial over racial profiling sparked by Owensby's death was beginning.

[8]None of the charges was for violent offenses. The charges included parking tickets, not wearing a seatbelt, and loitering, as well as running from police.

Three days of violence–arson, assault, looting, property destruction and shooting–erupted from April 10-12. The mayor declared a state of emergency and announced a city-wide curfew on April 12, which eventually quelled the riot.

2.3 Events Post Riot

On May 3, U.S District Judge Susan Dlott approved a "collaborative procedure" for resolving the racial profiling lawsuit. The process called for the city and the plaintiffs to work towards a negotiated settlement. On May 7, 2001, the DOJ launched a full-scale investigation into the Cincinnati police's alleged pattern of excess use of force violating the civil rights of residents. On May 8, 2001, the Hamilton County Prosecutor's Office and a grand jury indicted officer Roach for negligent homicide and obstruction of official business, both misdemeanors. In October 2001, the Justice Department released a 23-page report identifying numerous problems at the CPD. A time-line with all the events is provided in Figure 1.[9]

The racial profiling lawsuit generated by the Owensby death in November 2000, the media blitz about the riot, the DOJ investigation, and the indictment following the April 2001 Thomas death increased the cost of any potential mistake in policing, which this paper uses to examine officers' behavior.[10] Since the riot was more dramatic, this paper focuses on the April 2001

[9] In April of 2002, the city, the African-American plaintiffs and the Fraternal Order of Police reached a settlement that could resolve the racial profiling lawsuit without a trial. The Collaborative Agreement contains the following provisions: i) incorporate the Dept. of Justice use of force provision, ii) create a citizen complaint authority with jurisdiction over police misconduct matters, and iii) institute CPOP–community problem oriented policing, which partners the community and the police in addressing crime from more than the traditional enforcement model.

[10] One piece of anecdotal evidence that officers were afraid to do their jobs in such an intense period: in late June, Keith Fangman wrote in a newsletter to the Fraternal Order of Police, the police union, for which he is the president: "If you want to make 20 traffic stops a shift and chase every dope dealer you see, you go right ahead," he wrote.

intervention.

3 Empirical Evidence of the Impact of The Increased Price of Error on Policing

I begin my empirical analysis by establishing a relationship between change in policing and increased cost of error after the riot. I consider three different sources of variation: the city-wide time series of arrests, the differential arrest pattern across offenses over which officers have different degrees of discretion, and the impact of community percentage of African-Americans on community-level arrest rates. In section 4, I examine changes in crime, which provides further evidence of change in policing.

One important (and verifiable) aspect of policing is number of arrests. The Division of Statistics of the CPD provided the incidence-level data on both misdemeanor and felony arrests from January 1999 to November 2001. In the analysis below, I use a monthly interval because it provides a natural way to iron out day-to-day fluctuations. April 7 of 2001, the day of the lethal shooting, was treated as a watershed. I treat the first week of April as an extension of March and adjust for the days covered. I treat the period from April 7 to the end of April as April and adjust for the days covered.[11]

"Just remember that if something goes wrong, or you make the slightest mistake in that split second, it could result in having your worst nightmare come true for you and your family, and City Hall will sell you out."

[11] Specifically, the March arrests for the purpose of the analysis is (the true March arrests+true April arrests before or on the April 7/(31+7)*31). The April arrests for the purpose of the analysis is (the true April arrests after April 7/23*30).

3.1 City-Wide Time-Series

City-wide monthly felony arrests from January 1999 to November 2001 are plotted in Figure 2A. Felony arrests exhibit a hardly detectable change after the riot, but show a visible drop after November 2000. Formal econometric analysis controls for the seasonal effects by including month dummies:

$$Arrest_{m,y} = \alpha_m + \beta_1 Nov_2000 + \beta_2 Riot + \varepsilon_{m,y}, \tag{1}$$

where $Arrest_{m,y}$ is monthly arrest number, α_m are month fixed effects, and Nov_2000 takes the value of 1 if the month is in or after November 2000 when Roger Owensby, Jr. died in police custody. $Riot$ takes the value of 1 if the month is in or after April 2001. Under this specification, β_1 and β_2 capture the effect on police officers' arrests of increased cost of error due to November 2000 and April 2001 events, respectively.

Column 1 of Table 1 examines the monthly total felony arrests. The change in felony arrests after November 2000 is statistically significant while the change after the riot is not. After November 2000, police officers made 48 fewer felony arrests per month. Evaluated at the mean value of 473 before November 2000, it is a 10 percent decrease. After April 2001, police officers made 57.3 more felony arrests per month. Evaluated at the mean value of 461 before April 2001, it is a 12.4 percent increase. The sum of these two estimated coefficients is insignificantly different from zero; compared to the period before these two interventions, arrests for felony crime changed little during the post-riot period. The insignificance of the sum could be the result of two opposing forces. On the one hand, police officers cut down arrests amid media blitz, a Justice Department investigation, and a criminal indictment. Meanwhile, as will be shown in Section 4, felony crime surged after both of these two events and officers faced pressure to respond.

City-wide monthly misdemeanor arrests from January 1999 to November 2001 are plotted

in Figure 2B. The decline in misdemeanor arrests after the riot was striking. The drop after November 2000 was smaller. Regression results on misdemeanor arrests using the same specification as Equation (1) are in column 2 of Table 1. Monthly arrests decreased by 889 after November 2000 and by 1,151 after April 2001. Evaluated at the mean of 4,690 for arrests before November 2000 and 4,377 for arrests before April 2001, they correspond to reductions of 19.0 and 26.3 percent, respectively.

The dampening effect of the riot on misdemeanor arrests seems to weaken beginning in August 2001. A development in July 2001 provides a possible explanation. In response to the most violent spring and summer in decades, a violent crime task force, a 70-member unit, was formed in July 2001. This might have served as a signal from the CPD (and the public) to the officers that the crime-fighting aspect of their jobs was still important, at a time when officers were severely concerned about complaints amid an environment of intense scrutiny. I thus incorporate this event in the regression:

$$Arrest_{m,y} = \alpha_m + \beta_1 Nov_2000 + \beta_2 Riot + \beta_3 Aug_2001 + \varepsilon_{m,y}, \tag{2}$$

where Aug_2001 takes the value of 1 if the month is in or after August 2001.

Regression results on misdemeanor arrests using this specification are in column 2 of Table 1. Indeed, the reduction in arrests due to the riot is made more prominent by including this additional variable. The percent drop due to the November 2000 event and the riot are now 18.2 and 35.0, respectively. The establishment of the violent crime task force appeared to have successfully boosted misdemeanor arrests.[12]

[12] Interestingly, this establishment that originally targeted violent crime had little effect on arrests for violent crime after August 2001.

3.2 Changes in Arrests As a Function of Officer Discretion

Officers have different degrees of discretion over different offenses. Offenses which result in a call for service leave officers with little discretion since they have to respond to a call for service. Certain kinds of crime tend to find their way to a call to the police station, either by victims or witnesses. Domestic violence is a prominent example of such a kind. If oversight reduces policing, then we should see that it is for those offenses where the officers have discretion that the arrests will fall. Arrests should not change for offenses where officers have little discretion.

Felonies are reported to the police by victims (while misdemeanors are in general not known until an arrest is made) and are more serious than misdemeanor crime. Police officers thus have more pressure to tend to felony rather than misdemeanor offenses. The finding in the previous subsection that felony arrests did not change after the riot while misdemeanor arrests did is thus consistent with this prediction.

Second and more notably, there is huge variation within misdemeanor offenses in terms of officers' discretion. Misdemeanor offenses cover many categories, including but not limited to drug- and drinking-related violations, disorderly conduct, and domestic violence.[13] Figures 3A to 3B plot city-wide monthly arrests for drug-related violations and domestic violence between 1999 and 2001 respectively.[14] The reduction in arrests for the drug-related violations was striking and arrests for domestic violence changed little after the riot.[15] Time-series regression using Equation

[13] These four offenses have the highest frequency of arrests at the CPD.

[14] Figures 2A, 2B, 3A, and 3B all plot arrests one year on top of another. Figure 3C plots arrests along the same time line.

[15] It appeared that number of arrests for domestic violence in 1999 was greater than that in 2000 and 2001, which is captured by the significantly negative coefficient on the variable of November_2000. Indeed, when I add a 1999 year fixed effect, arrests of domestic violence changed little after either November 2000 or April 2001.

(2) with results reported in Table 1 confirm the visual observation. For drug-related offenses, disorderly conduct, and drinking violations, monthly arrests after the riot decreased by 44, 36, and 72 percent, respectively. In the case of domestic violence, on the contrary, there was no statistically significant change after the riot. The effect of the November 2000 event was similar to that of the riot event, but the magnitude was generally lower.

3.3 Community-Level Changes in Arrests As a Function of the Percentage of African-Americans

Communities differ in their percentages of African-Americans. As I later demonstrate, in the city of Cincinnati, a community with a higher density of African-Americans is associated with more crime (and arrests) before the riot. During the remaining months after the riot, officers in communities with a greater density of African-Americans should be more reluctant about policing since they will necessarily have more contacts with African American suspects, which results in a greater likelihood of being complained about "racial profiling". In this section, I relate community percentage of African-Americans to community-level changes in arrest rate (number of arrest per 1000 residents) after the events.[16]

Before presenting regression results, Figure 4 plots changes in the average monthly arrest rate after the riot against the community-level percentage of African-Americans. There is a clear negative relationship between arrest increases and black percentage. The fitted regression line is also included in the figure.[17]

[16]Since babies commit little crime and adolescents commit crime (and arrests are made against them), the "true" involved population is people of age, say, 14 and over. Between a sample of age 18 and over and a sample of all, I thus choose the former and the corresponding percentage of African-Americans. In robustness checks, I use the latter.

[17]The figure plots the scatter diagram for 51 out of the 53 communities in the City of Cincinnati. Community

The panel data regressions take the following specification:

$$\begin{aligned} Arrest_rate_{c,m,y} &= \alpha_c + \alpha_m + \beta_0 blk_pct_c + \beta_1 Nov_2000 + \beta_2 riot + \beta_3 Aug_2001 + \\ &\quad \gamma_1 blk_pct_c * Nov_2000 + \gamma_2 blk_pct * riot + \gamma_3 blk_pct * Aug_2001 + \varepsilon_{cmy} \quad (3) \end{aligned}$$

where c indexes communities, m reflects month, and y represents year. The left-hand-side variable is the monthly community-level misdemeanor arrest rate.[18] α_m represents month fixed effects (α_c represents community fixed effects when applicable). Variable blk_pct_c is the percentage of African-Americans in that community. Variable Nov_2000 takes the value of 1 if the month is in or after November 2000, $riot$ takes the value of 1 if the month is in or after April 2001, and Aug_2001 takes the value of 1 if the month is in or after August 2001. As in Equation (1), Nov_2000, $riot$, and Aug_2001 are used to capture the effect of these events on misdemeanor arrests, here at the community level. The two variables that are of the most interest are the two interaction terms: $blk_pct_c * Nov_2000$ and $blk_pct_c * riot$; they are constructed to capture the differential impact of the events on communities with different densities of African-Americans.

Community-level demographic variables, population and race, are computed from the tract-level data, available from Census 1990.[19] I use a map of Cincinnati to determine which tracts constitute

C.B.D. is dropped from the graph, as its black percentage from two distinct data sources produces dramatically different values (See footnote 14 on the alternative data source). Community Over-the-Rhine, where the fatal shooting occurred, is an extreme outlier in terms of drop in arrests. Both are omitted from the figure, but are included in all other statistical analyses.

[18] I focus on arrests of misdemeanor offenses because we already found in Section 3.1 that arrests for felony crime changed little.

[19] The City of Cincinnati's web-site provides demographic data at the community level. Reassuringly, these two methods produce highly consistent numbers on the population and race at the aggregate level (city level). The drawback with this alternative piece of data is that it divides the city into 45 communities, where data on arrests have the city comprised of 53 communities.

which communities. Community-level arrest data are computed from the raw incidence-level arrest data where items on time, location (community), and type of offenses are recorded. Arrest rate is then obtained by dividing number of arrests by community population. Since there are 53 communities spanning 35 months (January 1999 to November 2001), there are 1,855 observations in the sample.

Based on Census 1990, the City of Cincinnati had an adult (age 18 and over) population of 275,040, and African-Americans constituted 34.13 percent.[20] Summary statistics on community-level variables are provided in Table 2. There is a great deal of variation in the size of population and percentage of African-Americans across communities. They are constant over time because the decennial nature of the Census data. An average community has 5,306 adult residents with standard deviation of 5,097. An average community has 39.68 percent of the population constituted by African-Americans, with a standard deviation of 31.92 percent. A community at the 25th percentile has 8 percent of African-Americans, and one at the 75th percentile has 70.89 percent.

Since this analysis is at the community level and at a monthly frequency, arrests can take a value of zero. I thus use Tobit as well as OLS regression methods. OLS includes community fixed effects. Random effects, instead of fixed effects, are chosen for Tobit analysis because of computational expediency.

Table 3 provides the regression results. The coefficient on the African-American percentage across the first three columns is positive, implying that the arrest rate in one community increases with the percent of African-Americans in that community. In contrast, the coefficient on the interaction term, the African-American percentage after the riot, is negative. The negative coefficient implies that in the months after the riot, the reduction in arrests was greater in communities with a

[20] For total population and the corresponding percentage, it is 364,040 and 37.94.

higher ratio of African-Americans. The estimates are statistically significant and their magnitude is economically significant: based on the estimate in column 1 and evaluated at the mean arrest rate before the riot, a community at the 75th percentile of African-American population experienced an additional $(70.89 - 8) * .11/20.65 = 33.5$ percent decrease in the monthly arrest rate after the riot compared to a 25th percentile community. The effect of the November 2000 event was similar to that of the riot but the magnitude is smaller.

Omitted variables may be a concern in the regressions given the relatively limited set of covariates available. Including community fixed-effects is a way to absorb the time-invariant characteristics.[21] As shown in column 2, results using OLS with community fixed effects (in column 2) yield almost identical results from using Tobit random effects[22]

The remaining columns of Table 3 examine the three offenses with the highest arrest frequency that are found to have declined after the riot. Using Tobit with random effects, columns 3 and 4 show that arrests for both drug- and liquor-law violations dropped more in communities with a higher African-American percentage after the riot. For disorderly conduct (in column 5), the coefficient on the interaction term is negative but is statistically insignificant.[23]

[21] There are, however, community-specific time-varying characteristics. For example, communities with a higher percentage of African-Americans may experience a higher unemployment rate (and thus more crime) in months after the riot. But a higher unemployment rate in black communities after the riot would have biased the author against finding that those communities experienced greater arrest reductions.

[22] Since the value of community population and percentage of African-Americans are constant from 1999 to 2001, these two variables are naturally dropped in OLS with community fixed-effects.

[23] Results using OLS with community fixed effects (not displayed) in general yield more accurate estimates.

3.4 Alternative Explanations

A leading alternative explanation of the above findings is that officers collectively, that is, either through the union or the police department, were intentionally advocating slowdown in order to gain recognition of their work; they strategically slowed down. While this may be partly what was going on, anecdotal evidence suggests that this was not the whole story. In a June 30, 2001 article appearing in Enquire, a local newspaper, "...officers are starting to show up in greater-than-usual numbers to sit for police exams in other communities that have comparable wage scales. " Second, if one believes that a (threatening) lawsuit is more likely to illicit a feeling of reprisal out of officers than are media attention, Justice Department investigation, and criminal indictment, then I effectively control for the "intentional slowdown" in estimated Equation (1).

Third, the plaintiff of the racial profiling lawsuit, the CPD, and the city signed a Collaborative Agreement in April 2002, which contained the following provisions: i) change policy on use of force, ii) establish a citizen complaint authority with jurisdiction over police misconduct matters, and iii) institute community problem oriented policing. Signing the agreement effectively dropped the lawsuit, which eliminated the need of strategic slowdown, useful in a bargaining situation. The post-agreement period nevertheless still constituted a harsher environment for officers in that they were subject to consumer complaints. I therefore use this variation to test the effect of increased cost of policing on officers' behavior.

Figure 7 displays the sum of monthly arrests for misdemeanor and felony crime during the period of January 1999 to December 2004. Arrests during the post agreement period picked up, yet still demonstrably lower than the level before Nov 2000. To quantify the change in arrests, I run a time-series regression of the following specification:

$$Arrest_{m,y} = \alpha_m + \beta_1 Nov_2000 + \beta_2 Riot + \beta_3 Apr_2002 + \varepsilon_{m,y},$$

where $Arrest_{m,y}$ is monthly arrest number for all offenses, α_m are month fixed effects, and Nov_2000 takes the value of 1 if the month is before April 2002 and after November 2000, $Riot$ takes the value of 1 if the month is before April 2002 and after April 2001, and Apr_2002 takes the value of 1 is the month is in or after April 2002. Table 4 presents the regression results. The total of misdemeanor and felony arrests decreased by 40 percent due to the accumulated events in November 2000 and April 2002. The post-agreement period witnessed a climbing back of policing, but arrests were still 68 percent of the pre-November 2000 level.

Finally, to help differentiate the hypothesis of order from above with a hypothesis of officers afraid of being caught in trouble, I examine the differential behavior of seasoned officers and junior officers. The idea is that if there is order from above, senior and junior officers alike would cut down their policing. On the contrary, if officers calculate their risk of being caught in trouble, the junior ones harbor greater fear because they lack a record for the police department to support him or her in case of a fallout. Only misdemeanor arrests in 2001 contain data on the involved officer for each incident of arrest. I thus examine changes in arrests at the officer level as a function of his or her pre-riot arrest number and his or her entry year. Shown in Table 5, regression results (in column 2) suggest that officers who entered the police force before or in 1979 experienced an extra 41 percent increase in arrests, compared to officers entering in or after 2000. The same conclusion holds for officers entering in period 1980-1989 and period 1990-1999, although with smaller magnitude. The impact of entry years on change in policing behavior implies that depolicing probably does not result from order from the above but rather from officers' own assessment of risk.

Did the CPD decide to emphasize felony arrests and put less emphasis on misdemeanor arrests after the riot? This hypothesis can superficially explain the finding that felony arrests changed little and misdemeanor arrests fell substantially after the riot. If this hypothesis is valid,

that is, if officers had more energy and time for felony arrests, then arrests for felony offenses should have increased, and they did not. Moreover, according to the logic of this hypothesis, when the violent crime task force was formed in July 2001, misdemeanor arrests should have decreased further after July 2001 since violent (thus felony) crime was emphasized. Figures 2B and 3A show that misdemeanor arrests, no matter in total or in drug-law violation, picked up in August. These findings are better explained by a hypothesis that CPD's creation of the task force gave out a signal to officers that crime-fighting is important. This possibly encouraged the frustrated officers to step up their policing, which was reflected in more arrests of all kinds.

Did the CPD re-allocate the white officers to predominantly white communities and black ones to black communities in the wake of the riot? Donohue and Levitt (2001)'s estimates suggest that switching from a regime where police are assigned randomly by race to a policy that maximizes same-race policing can cause a decline in arrests. When their estimates are applied to the percentage of black officers at the CPD (25%) and the percentage of African-Americans at the City of Cincinnati (34%), such a policy change can result in an arrest decrease around 16 percent. There appears to be no documented change in assignment policy after the riot.

3.5 Robustness

In this subsection, I present further tests to help assess the validity of my results. Was the decrease in arrests due to reduction in personnel? Specifically, i) whether there was a decrease in the number of officers after the two events and ii) even if there was no overall personnel decrease, whether the percent of officers assigned to field work declined.

The total head-counts at CPD varied little over the years. In 1999, according to Bureau of Justice Statistics, the CPD had 1004 sworn officers and 298 civilians, and 750 officers were assigned

to field work (as opposed to administrative or technical jobs). In 2001, according to the CPD website, it had 1000 sworn officers. Information on whether there was a change in the proportion of officers assigned to field work is not readily available, but some insight can be gained from a data set on 2001 misdemeanor arrests which contains information on the officers' name and badge number.[24] The total number of officers who made arrests in 2001 was 849. The 631 officers who made arrests throughout 2001 made on average 3.72 monthly arrests before the riot and 2.87 after. Twenty-nine officers who made arrests only before the riot made on average 1.03 monthly arrests. 189 officers who made arrests after the riot registered .92. Based on these, the ones showing up in arrest data after the riot were slightly less aggressive (11 percent) than the ones who disappeared from the arrest data. But, with the increased number of officers participating in arrests, the average monthly arrests at the extensive margin in fact increased! On the contrary, the most aggressive ones were those who made arrests throughout the year, and they cut down their arrests by 22.8 percent.[25] In all, the decline in arrests is not due to a reduction in the number of officers assigned to the field, but to a reduced policing on the incumbents.

Since different offenses for which a suspect was arrested were entered as separate observations, could the decrease in arrest numbers be due to a reduction in the number of offenses per suspect rather than a reduction in the number of suspects arrested? The detailed data set on misdemeanor arrests in 2001 records the offenses for which a suspect was arrested as well as the

[24] One constraining factor of this data set is that the name and badge number are not available for arrests of adolescents. Moreover, a small proportion of officers had only one record of arrest in the data set. I drop those observations based on the belief that a single record could more likely be due to error in data entry of names or badges than an actual single arrest throughout a year for an officer.

[25] After a crude adjustment for seasonal effects, the decrease was 30 percent. Note that the percent decrease of misdemeanor arrests from the basic result in Table 1 was 27.8. The discrepancy can be readily explained by the increase at the extensive margin.

suspect's identification information. Suspects were on average arrested for 1.22 offenses before the riot, and 1.26 after. Therefore, the evidence suggests that the decrease in arrests was not due to fewer offenses per suspect, but fewer suspects arrested.

Misdemeanor arrests during April 2001, especially the week of the riot, may have changed because of the riot itself. Row 2 of Table 6 exhibits the result of the panel data analysis using Equation (3) with April 2001 dropped from the sample. For both total misdemeanor and drug-law violation arrest rates, the coefficients on the interaction term are not affected by this exclusion.

I also perform other robustness checks. I replace the population of age 18 and over with the total population. The same is applied to the percentage of African-Americans. Panel data regression results are shown in row 3 of Table 6. The percentage of African-Americans had a smaller impact on the reduction in post-riot arrests, compared to the baseline estimates transcribed from Table 3.

I examine percent change in community arrest rate by using a new dependent variable– log of arrest rate. The estimated coefficient $-.0033$ (using community fixed effects) suggests that, compared to the community at the 25th percentile (8 percent), the community at the 75th percentile of African-American population percentage (70.89 percent) experienced an additional $(70.89 - 8) * .0033 = 20.8$ percent decrease in misdemeanor arrests. This is somewhat smaller than the estimates obtained (33.5 percent) by examining level change in Section 3.3.

Examining Figure 4, one is concerned that community 27 is instrumental in getting the negative relation between community percentage of blacks and the increase in arrests. I thus run the same regression excluding this community. Results shown in row 5 suggest that excluding community 27 yields coefficients very similar to those in the baseline estimates.

Bertrand et al. (2004) point out the potential problem of serial correlation in a difference-

in-differences estimator, which is the method used in my panel data analysis. One remedy is to collapse the monthly arrests into just pre- and post-riot average arrests. The number of observations thus drops to 106 (53 communities multiplied by 2 periods). The results are presented in row 4 of Table 6. For both total misdemeanors and drug-law violations, the effect of the race ratio has a bigger impact on reductions in arrests. The standard errors rise but the estimates remain statistically significant.

3.6 Further Evidence from Traffic Citations and Arrests

The preceding subsections offered evidence that officers cut down their criminal law enforcement activities facing increased oversight. This subsection provides exploratory evidence from traffic law enforcement. Traffic law violations include parking violations, moving traffic violations, speeding violations, seat belt violations, and driving under the influence (D.U.I. thereafter). D.U.I. is a misdemeanor offense, for which officers make arrests. All other traffic violations are not criminal infractions, for which citations are issued.

Incidence-level citation and arrest data for traffic violations are not available; only the yearly data are. Citations and arrests for traffic violations are substantial. In 2000, there were 63,643 and 69,929 citations for parking and moving traffic violations, respectively (compared to total misdemeanor arrests of 54,616 in the same year). Speeding violations, seat belt violations, and D.U.I. violations were 20,902, 8,636, and 1,846, respectively.

For the purpose of evaluating the effect of the April 2001 riot on the police officers' behavior in traffic law enforcement, yearly data are less than ideal. Using the percentage change from 2000 to 2001 to capture the total effect of the riot and the November 2000 event assumes that both events took place at the end of 2000 or the beginning of 2001. It is a less than ideal assumption but a

pretty close one, considering that one is three months after the end of 2000 and the other is two months prior to the end of 2000.

With this caveat in mind, citations and arrests for traffic violations dropped dramatically in 2001 compared to 2000, as shown in Figure 5. Citations for parking violations, moving traffic violations, speeding violations, and seat belt violations decreased by 36.5, 52.4, 42.6, and 71.8 percent, respectively. Arrests for D.U.I. violations fell by 50.2 percent. Notice that during the same time period, the decrease for auto accidents investigated was only 1.3 percent.

One event should be reported before concluding that the decrease in traffic citations and arrests was due to the increased oversight as a result of the riot and the November 2000 event. In May 2001, the Cincinnati City Hall passed a law requiring police to fill out a card recording information on the race, gender, and age of drivers and passengers for every traffic stop. This requirement would have put the officers under heightened fear of a charge of "racial profiling." Citations for parking violations, however, were not subjected to this requirement since no traffic stop was involved. The 39 percent decrease in citations for parking violations from 2000 to 2001 thus provides evidence that enforcement activities were greatly subdued in traffic law, as they were in criminal law.

4 The Impact of Increased Oversight on Crime

The preceding section established that police officers at the CPD cut down their policing when they faced more oversight. This section offers evidence on crime. Examining crime is complicated by the fact that data on misdemeanor offenses are not available (a misdemeanor offense usually goes uncounted unless an arrest is made). Felony offenses, however, are reported by victims to the law enforcement agencies. Thus, I can analyze whether felony crime changed during the period of substantially reduced policing.

The three sources of variations and econometric specifications used to investigate felonies are identical to the arrest analysis in the preceding section. Incident-level data on felony offenses from January 1999 to November 2001 are provided by the CPD.

Figure 6 plots the monthly felony offenses from 1999 to 2001. There was a clear surge in felony offenses in the months after April 2001.[26] The effect of the November 2000 event was also detectable. Time-series regression results shown in Table 7 (odd-numbered columns examining the level while the even-numbered the log) suggest that on average, monthly felony crime increased by 317 after the riot, a 14 percent increase. The increase after the November 2000 event is statistically significant yet more subdued: a 7 percent increase.

Compared to property crime, violent crime after the riot increased by a smaller amount, which, however, constituted a greater percentage increase. The effect of the Nov 2000 event is of less magnitude, but is statistically significant as well.

I compare the magnitude of the elasticity of crime to policing to the police elasticity of crime reported in previous work (Di Tella and Schargrodsky 2004, McCrary 2002, Levitt 1997). The estimated change in violent and property crime after the riot (from Table 7) are 21 and 13 percent. The estimated change in policing after the riot, approximated by change in total arrests (from Table 1), is 41 percent. Thus, the elasticity of violent and property crime to policing are -.51 and -0.32.[27] The magnitude of these two elasticities is smaller than the reported -1.0 and -0.3 in Levitt (1997) and greater than the -0.12 and -0.12 in McCrary (2002). Di Tella and Schargrodsky (2004) obtained an elasticity of -0.17 for auto-theft with respect to police. It remains an open question

[26] Evidence on emergency calls provides another perspective that crimes indeed increased: the number of emergency calls increased from 555,272 in 2000 to 637,398 in 2001, a 14.8 percent increase.

[27] If one considers the variation induced by both the riot and the November 2000 event, the elasticity of violent and property crime to policing are -.67 and -0.41.

as to whether the greater elasticity of this study represents a partially spurious relationship in the crime regressions, singularity of the relation between the public and the police at the City of Cincinnati, or that policing is at least as important as the presence of police in reducing crime.

As a further test of my hypothesis, I analyze the increase in violent crime and property crime as a function of community percentage of African-Americans. If increased fear among officers caused greater arrest reductions in communities with a higher percentage of African-Americans, and at least some crime was committed locally, one should see an additional increase in crime in those communities. The regression on crime uses the same specification as Equation (3) except that the dependent variables are monthly community-level felonies.

Table 2 provides the summary statistics on monthly felony crime at the community level. From 1999 to 2001, an average community experienced 9.93 crimes per 1000 adult residents per month. Violent and property crime constitute 13 and 87 percent, respectively. Within violent crime, robbery and aggravated assault occupy 87.3 percent. Within property crime, burglary and auto-theft take up 38.4 percent. There is a great deal of variation in crime rate.

Table 8 presents the results of this analysis. Columns 1 and 2 examine the violent crime; columns 3 and 4 examine the property crime. The odd-numbered columns use OLS with error terms clustered at the community level and adjusted for heteroskedasticity; the even-numbered columns employ OLS with community fixed effects.

Communities with a greater percentage of African-Americans appear to experience higher crime rates, as expected. Novel is the finding that those communities experienced an additional increase during the period after the riot. For violent crime and evaluated at the mean, the estimated coefficient on the interaction term (in column 2) suggests that after the riot, a community at the 75th percentile of African-American percentage experienced an additional $(70.89-8)*.0070/1.15 =$

38.3 percent increase in monthly crime rate compared to a community at the 25th percentile. There was no such pattern for property crime.

Using community fixed effects allows me to control for time-invariant unobserved heterogeneity across communities but cannot control for time-variant ones. One natural question thus arises: was the greater increase in crime in black communities due to greater unemployment after the riot (rather than reduced policing)? Unemployment rates at the community level and at monthly intervals are hard to obtain, but previous research sheds light on this concern. Raphael and Winter-Ebmer (2001) found a positive effect of unemployment on property crime rate and the evidence for violent crime is considerably weaker. Our findings that black communities experienced a greater increase in violent crime and not in property crime points to the role played by reduced policing.

Was the crime increased due to African-Americans retaliating against whites? Crime data do not have information on the race of the victims. But anecdotal evidence suggests invalidity of this hypothesis. According to a July 2, 2001 article in The Enquirer, the local newspaper of the city of Cincinnati, 59 people were the victims of 41 gun shootings during the period of April 7 to the end of June. 58 out the 59 victims were black, and the 22 known and arrested suspects were black males. Moreover, these black-on-black shootings occurred in predominantly African-American neighborhoods.

5 Conclusion

A common way to discipline a bureaucracy is to rely on ex-post outside oversight. Oversight is usually initiated by consumers' complaints about an error agents in a bureaucracy make. The errors are of two types: granting resources to an unsuitable candidate or denying resources to an

eligible candidate. A complaint about a specific agent is much more likely to be prompted by the second type. Because of this inherent asymmetry, ex-post oversight induces agents in a bureaucracy to grant resources excessively. This paper provides empirical evidence supporting this prediction in a police setting.

This paper uses events surrounding the April 2001 riot in Cincinnati as a natural experiment. On April 7, 2001, a white officer shot dead an unarmed 18-year-old African-American man. A three-day riot ensued. This event attracted huge media attention, and the Department of Justice immediately began a civil right investigation into the Cincinnati Police Department. A racial profiling lawsuit was unfolding almost simultaneously. The sharply increased one sided attention to error in policing is used to examine its effect on officers' policing, in particular, arrests.

Police officers at the CPD greatly reduced their arrests in the remaining months of 2001 compared to the period from January 1999 till the riot. The before-after estimates show that felony arrests changed little and monthly misdemeanor arrests decreased by 35 percent. The decrease was most significant for offenses where police officers have the most discretion: arrests for drug- and liquor-law violations decreased by 44 and 72 percent, while change in arrests for domestic violence was statistically insignificant. Decrease in misdemeanor arrests was more significant in communities with a higher percentage of African-Americans. The same period witnessed a surge in crime–monthly felony offenses increased 14 percent after the riot. The increase was greater for violent crimes (21 percent) than property crimes (13 percent). In addition, communities with a higher percentage of African-Americans experienced a greater increase in violent crimes.

This empirical study highlights a caution in using ex-post oversight in managing a bureaucracy, which may help explain why bureaucracy exhibits "unresponsiveness" towards consumer complaints (Prendergast 2003). This study has two limitations. First, the exogeneity of the riot

can be better assessed if one can examine whether there was racial discrimination in officers' arresting behavior before the riot. Second and related to the first, I stop short of a complete welfare analysis. I showed that one consequence of the reduced policing was the surge in crime, but I did not provide an analysis on whether there was discrimination, and if there was, whether it abated or not after the riot.[28] They are not carried out because of severe data constraints and can be taken up in future research.

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Table 1

Monthly Arrests: Time Series

Variable	Felony Arrests	Misde-meanor Arrests	Misde-meanor Arrests	Drug-law violations	Disorderly conduct	Liquor-law violations	Domestic Violence
November_2000	-48.0	-889.4	-852.9	-224.9	-39.7	-130.6	-43.4
	(19.0)	(117.9)	(115.8)	(41.6)	(29.1)	(30.3)	(11.7)
Riot	57.3	-1150.7	-1530.3	-425.1	-179.1	-289.4	8.5
	(18.9)	(164.1)	(150.7)	(54.6)	(34.0)	(51.7)	(23.5)
August_2001	--	--	690.5	194.9	12.1	101.7	33.4
			(139.1)	(44.3)	(37.9)	(49.7)	(23.3)
R^2	.83	95.4	97.6	96.3	87.4	93.5	51.5
Percent change after Nov. 2000	-10.1	-19.0	-18.2	-22.1	-7.8	-29.1	-17.0
Percent change after the Riot	12.4	-26.3	-35.0	-43.6	-36.2	-71.5	--

1. The data set is comprised of monthly city-level observations for the period of January 1999-November 2001. The number of observations is equal to 35 in all columns. Arrest data are based on incident-level arrest records provided by the Cincinnati Police Department.
2. The dependent variable is the monthly arrests of offense named at the top of each column. November_2000 is a dummy variable which takes the value of 1 for the months in or after November 2000. Riot is a dummy variable which takes the value of 1 for the months in or after April 2001. August_2001 is a dummy variable which takes the value of 1 for the months in or after August 2001.
3. Month-fixed effects are included in all regressions.
4. -- obtains because the coefficients are statistically insignificant or not applicable.
5. Standard errors, adjusted for heteroskedasticity, are reported in parentheses.

Table 2
Summary Statistics at Community Level

Variable	Mean	Standard Deviation
Population, age 18 and over	5,306	5,097
Percentage of African-Americans, age 18 and over	39.68	31.92
Misdemeanor arrests per 1000 residents, age 18 and over	18.91	27.02
Drug-law violation arrests	4.05	7.72
Liquor-law violation arrests	1.74	4.56
Disorderly conduct arrests	2.07	2.93
Domestic violence arrests	1.09	1.84
Felony crime per 1000 residents, age 18 and over	9.93	8.83
Murder	.02	.09
Rape	.14	.30
Robbery	.62	1.01
Aggravated assault	.48	.78
Burglary	2.24	2.14
Auto-theft	1.09	1.20
Larceny	5.34	5.90

1. All values reported are means of monthly, community-level observations for the period from January 1999 to November 2001. All summary statistics are based on 1855 observations.
2. Arrest data are based on the incident-level arrest records provided by the Cincinnati Police Department. Community-level demographic data are based on tracts data from Census 1990. Crime data are based on crime victims' reports to the Cincinnati Police Department.

Table 3
Panel Data Analysis of Misdemeanor Arrests at Community Level

Variable	Total misde-meanor (1)	Total misde-meanor (2)	Drug-law violations (3)	Liquor- law violations (4)	Disorderly conduct (5)
Percent of African-Americans, age 18 and over	.36	--	.048	.027	.023
	(.01)		(.004)	(.003)	(.002)
November_2000	-.77	-.52	-.23	-.43	-.28
	(1.30)	(1.2)	(.45)	(.24)	(.24)
Riot	-3.1	-3.3	-.72	-1.03	-.70
	(1.8)	(1.7)	(.64)	(.35)	(.33)
August_2001	-.59	-.56	-.81	.14	.12
	(1.9)	(1.8)	(.68)	(.37)	(.36)
Percent of African-Americans*November_2000	-.08	-.08	-.020	-.0033	-.0024
	(.02)	(.02)	(.008)	(.0043)	(.0043)
Percent of African-Americans*Riot	-.11	-.10	-.047	-.014	-.0097
	(.03)	(.03)	(.011)	(.006)	(.0059)
Percent of African-Americans*August_2001	.09	.09	.045	.010	-.002
	(.03)	(.03)	(.011)	(.006)	(.006)
Number of zero	31	31	251	510	298
Adj. R^2	--	.007	--	--	--

1. The dependent variable is the monthly arrests per 1000 residents, age 18 and over, of the offense named at the top of each column. November_2000 is a dummy variable which takes the value of 1 for the months in or after November 2000. Riot is a dummy variable which takes the value of 1 for the months in or after April 2001. August_2001 is a dummy variable which takes the value of 1 for the months in or after August 2001.
2. The data set is comprised of monthly community-level observations for the period from January 1999 to November 2001. The number of observations is equal to 1855 in all columns.
3. Month-fixed effects are included in all regressions.
4. The estimation method in all columns (except column 2) is Tobit with random effects. Tobit is chosen because there are many zero observations for the dependent variables (the number of zero observations is reported in the second row from the bottom). Community random effect (instead of fixed effect) for Tobit is chosen because of the computational expediency. Column (2) uses OLS with community fixed effects. Standard errors, adjusted for heteroskedasticity, are in parentheses.

Table 4
Monthly Arrests: A Longer Time Series

Variable	Total Arrests	Log(Total Arrests)	Total Arrests	Log(Total Arrests)
November_2000	-890	-.18	-846	-.17
	(105)	(.03)	(103)	(.03)
Riot	-997	-.27	-1522	-.41
	(155)	(.04)	(122)	(.03)
August_2001	--	--	759	.21
			(134)	(.03)
April _2002	-1393	-.32	-1395	-.32
	(78)	(.02)	(76)	(.02)
R^2	.88	.88	.92	.91
Percent change after Nov. 2000	-36	40	-31	40
Percent change after The Riot	-27	32	-27	32

1. The data set is comprised of monthly city-level observations for the period of January 1999-December 2004 (correct data on Dec. 2001 is missing). The number of observations is equal to 71 in all columns. Arrest data are based on incident-level arrest records provided by the Cincinnati Police Department.
2. The dependent variable is the monthly arrests of all offense—felony and misdemeanor. November_2000 is a dummy variable which takes the value of 1 for the months before April 2002 and after November 2000. Riot is a dummy variable which takes the value of 1 for the months before April 2002 and after April 2001. August_2001 is a dummy variable which takes the value of 1 for the months before April 2002 and after August 2001. April _2002 is a dummy variable which takes the value of 1 for the months in or April 2002.
3. Month-fixed effects are included in all regressions.
4. -- obtains because the coefficients are statistically insignificant or not applicable.
5. Standard errors, adjusted for heteroskedasticity, are reported in parentheses.

Table 5
Change in Officer-level Misdemeanor Arrests in 2001 As a Function of Officer Entry Year

	Change in Number of arrests	Change in log of arrests
Variable	(1)	(2)
No. of arrests before the riot	-.99	-.015
	(.02)	(.002)
Enter CPD before or in 1979	4.3	.41
	(3.8)	(.11)
Enter CPD 1980-1989	1.5	.22
	(3.6)	(.10)
Enter CPD 1990-1999	9.5	.17
	(2.2)	(.08)
Number of Obs	821	757
Adj. R^2	.95	.08

1. The dependent variable is number of misdemeanor arrests after the riot minus that before.
2. The data set is comprised of officer-level observations for year 2001.

Table 6
Sensitivity of Results to Alternative Specifications

Specification	Coefficient on the riot*percentage of African-Americans when the dependent variable is arrest rate of	
	Total misdemeanor	Drug-law violations
Baseline	-.11 (.03)	-.047 (.011)
Dropping month of April, 2001	-.11 (.04)	-.050 (.012)
Overall population	-.077 (.026)	-.031 (.009)
Dependent variable is log(arrest rate)	-.0033 (.0012)	-.005 (.002)
Excluding community 27	-.09 (.03)	-.045 (.010)
Adjusting serial correlation by collapsing dependent variable into before & after	-.13 (.05)	-.044 (.017)

1. Results in this table are variations on the specifications reported in column (1) and (3) of Table 3. All specifications are estimated using monthly community-level panel data from January 1999 to November 2001.
2. Standard errors, adjusted for heteroskedasticity, are in parentheses.

Table 7
Felony Crime in Total and By Offense: Time Series

Variable	Total	Log(total)	Violent Crime	log(violent)	Property Crime	log(property)
November_2000	102	.07	29	.11	113	.07
	(42)	(.03)	(12)	(.04)	(47)	(.03)
Riot	317	.14	71	.21	287	.13
	(83.5)	(.03)	(17)	(.05)	(60)	(.03)
R^2	.95	.95	.93	.94	.93	.93

1. The dependent variable is the monthly crime named at the top of each column. November_2000 is a dummy variable which takes the value of 1 for the months in or after November 2000. Riot is a dummy variable which takes the value of 1 for the months in or after April 2001.
2. Crime data are based on crime victims' reports to the Cincinnati Police Department. The data set is comprised of monthly city-level observations for the period of January 1999--November 2001. The number of observations is equal to 35 in all columns. Violent crime is composed of murder, rape, aggravated assault, and robbery. Property crime comprises of burglary, auto-theft, and larceny.
3. Month-fixed effects are included in all regressions.
4. Standard errors, adjusted for heteroskedasticity, are reported in parentheses.

Table 8
Panel Data Analysis of Felony Crimes at Community Level

	Violent crime		Property crime	
Variable	(1)	(2)	(3)	(4)
Percent of African-Americans,	.00007	--	-.0005	--
age 18 and over	(.00008)		(.0003)	
November_2000	-.47	.18	-1.46	.67
	(.16)	(.10)	(.96)	(.36)
Riot	.02	.01	.56	.55
	(.15)	(.14)	(.40)	(.51)
August 2000	.07	.09	.49	.50
	(.15)	(.15)	(.65)	(.55)
Percent of African-Americans*	.015	-.002	.05	.0005
November_2000	.004	(.002)	(.02)	(.0068)
Percent of African-Americans*	.0067	.0070	.006	.0058
Riot	.0037	(.0025)	(.010)	(.0091)
Percent of African-Americans*	-.0022	-.0028	-.001	-.0017
Aug 01	.0027	(.0026)	(.010)	(.0094)
No. of obs	1855	1855	1855	1855
Adj. R^2	.09	.04	.05	.03
Estimation Method	OLS	Community fixed effects	OLS	Community fixed effects

1. The dependent variable is the monthly crime per 1000 residents, age 18 and over, of the offense named at the top of each column. November_2000 is a dummy variable which takes the value of 1 for the months in or after November 2000. Riot is a dummy variable which takes the value of 1 for the months in or after April 2001.
2. The data set is comprised of monthly community-level observations for the period from January 1999 to November 2001. The number of observations is equal to 1855 in all columns.
3. Month-fixed effects are included in all regressions.
4. The estimation method in the odd columns is OLS with error term clustered by community and adjusted for heteroskedasticity. Results using OLS with community fixed effects are reported in even columns. Standard errors are in parentheses.

Figure 1: Timeline of Events

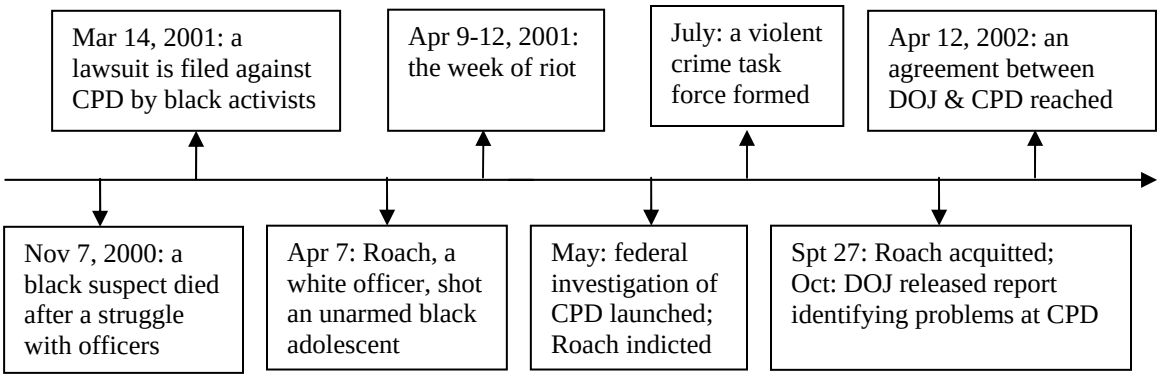


Figure 2A: Arrests for Felony Crime, 1999--2001

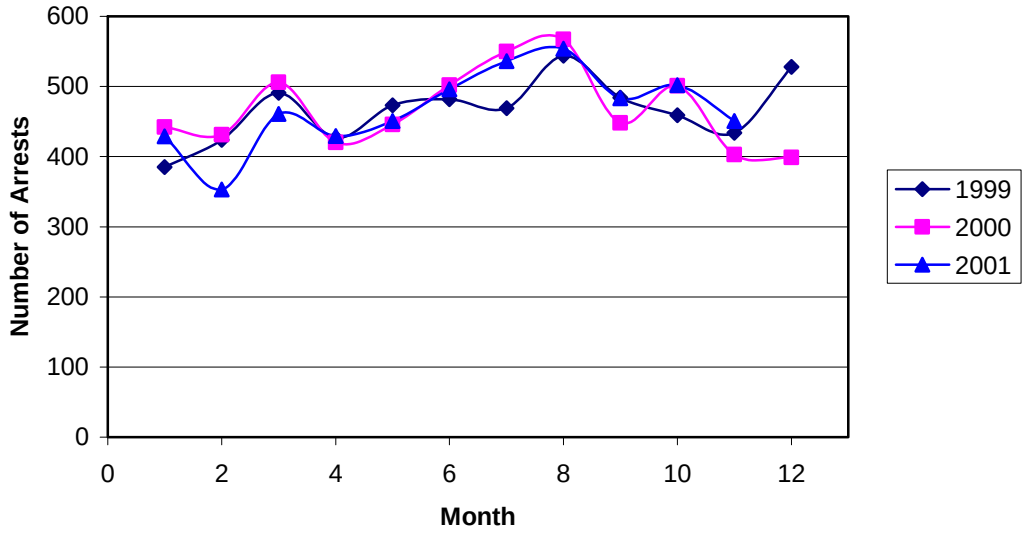
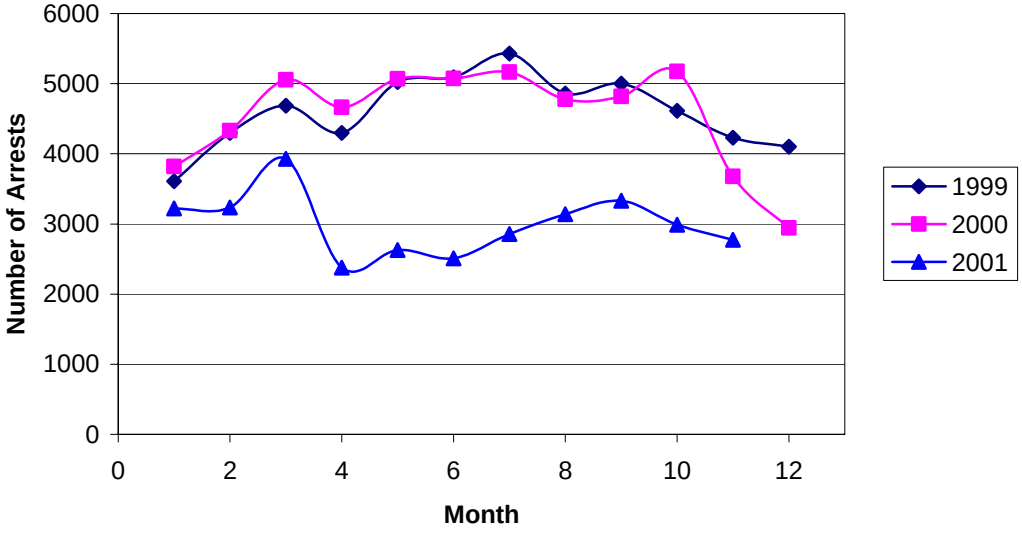


Figure 2B: Arrests for Misdemeanor Crime, 1999--2001



Data are city-level monthly arrests for crime during the period of January 1999 to November 2001. Felony crime includes violent crime (murder, rape, robbery, and aggravated assault) and property crime (burglary, motor vehicle theft, and larceny-theft). Misdemeanor crime includes drug-law violations, disorderly conduct, liquor-law violations, and domestic violence, etc. All data are based on incident-level arrests recorded by Cincinnati Police Department.

Figure 3A: Arrests for Drug-Law Violations, 1999--2001

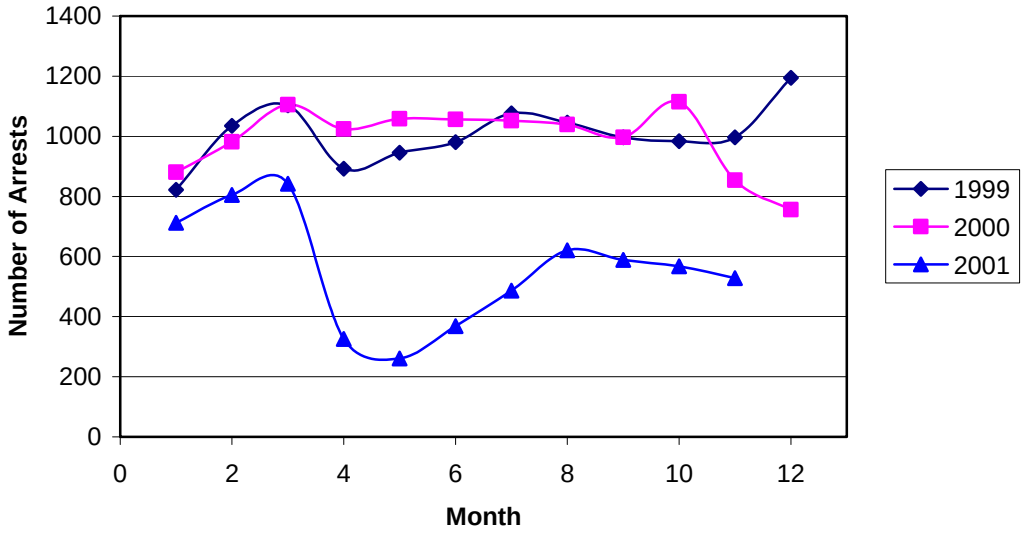


Figure 3B: Arrests for Domestic Violence, 1999--2001

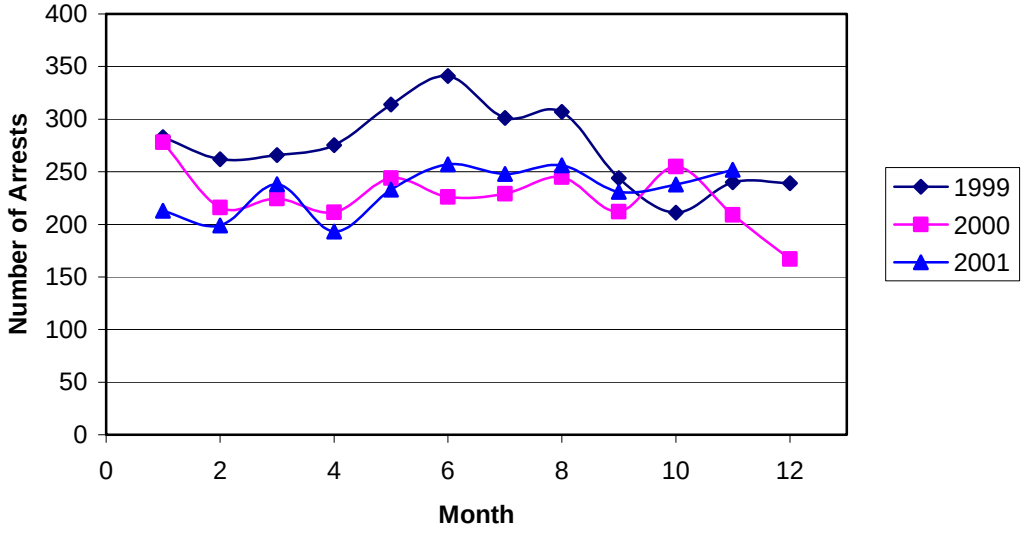
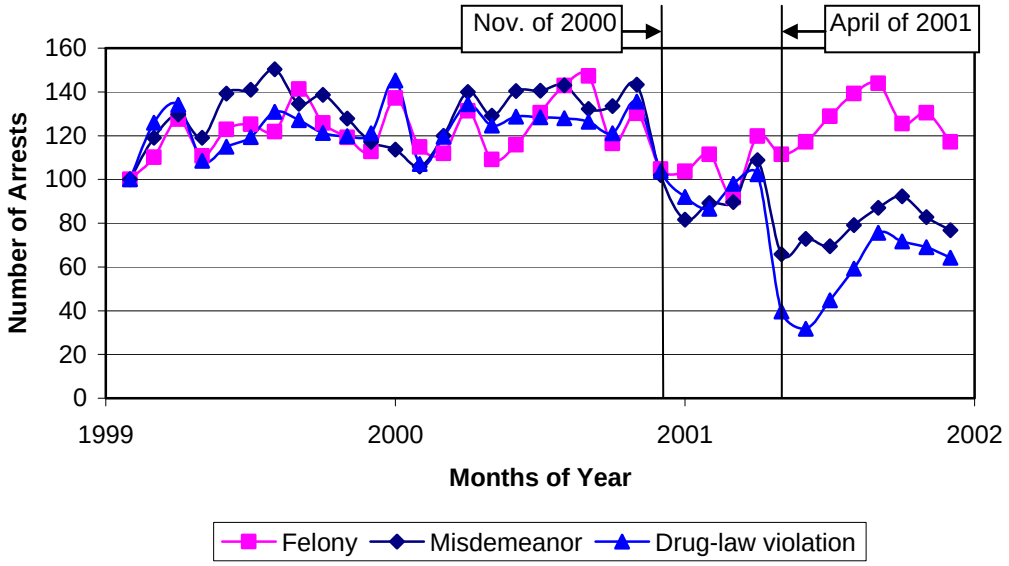
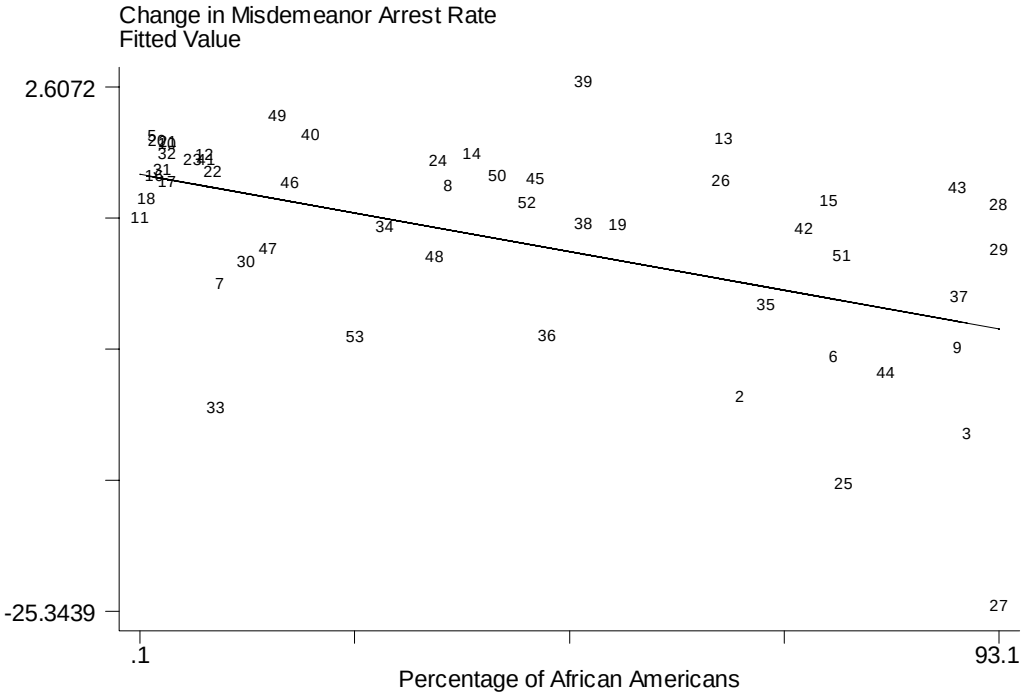


Figure 3C: Arrests for Three Categories of Crime, 1999--2001



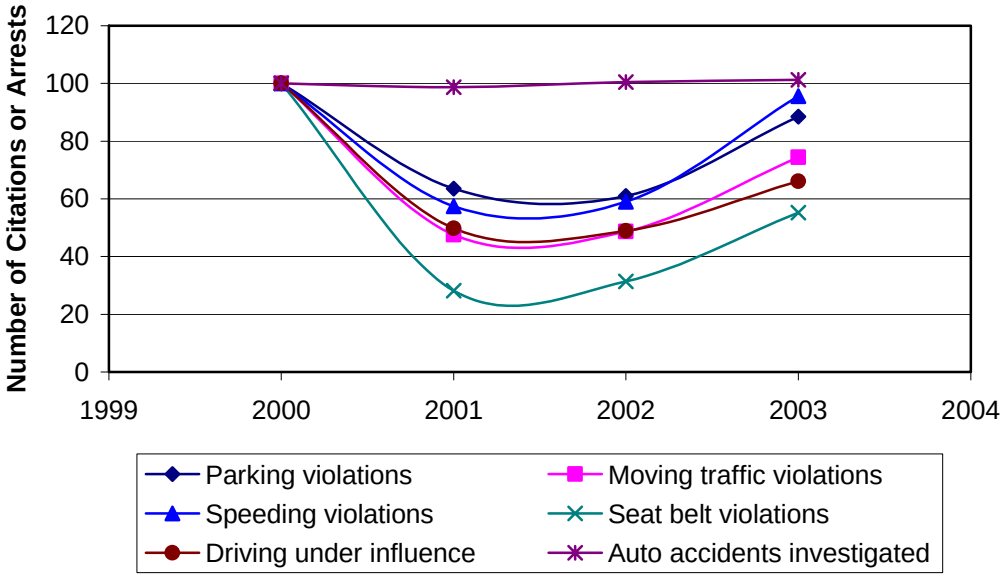
Data are city-level monthly arrests for crime during the period of January 1999 to November 2001. Felony crime includes violent crime (murder, rape, robbery, and aggravated assault) and property crime (burglary, motor vehicle theft, and larceny-theft). Misdemeanor crime includes drug-law violations, disorderly conduct, liquor-law violations, and domestic violence, etc. Drug-law violations include trafficking and possession of marijuana and other illegal drugs. Figures 3A-3B plot drug-law violations and domestic violence arrests one-year on top of another. Figure 3C plots felony, misdemeanor, and drug-law violation arrests along the same time line, indexed to equal 100 in January 1999. All data are based on incident-level arrests recorded by Cincinnati Police Department.

Figure 4: Changes in Arrests and Community African-American Percentages, 1999--2001



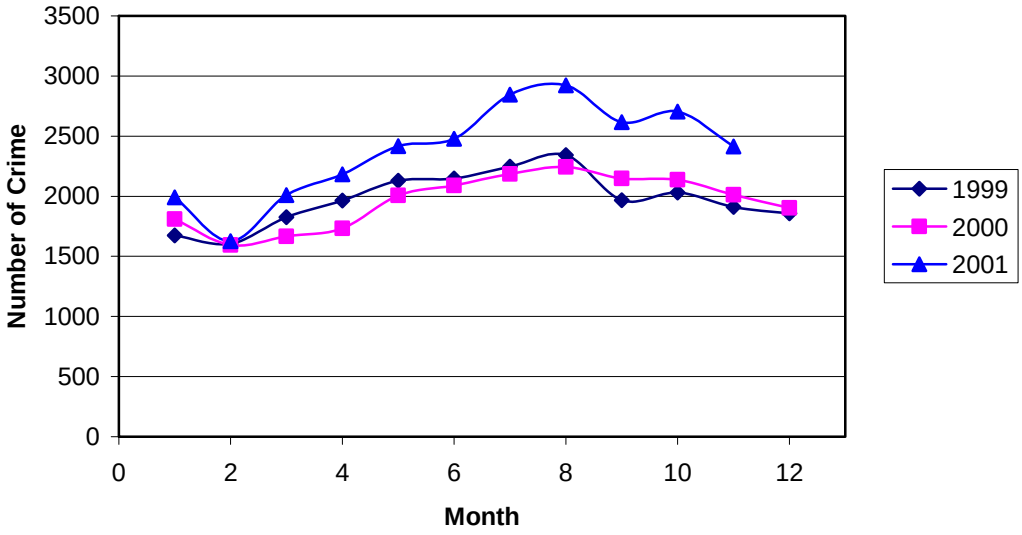
The vertical axis is the community-level change in monthly misdemeanor arrest rate before and after April 2001 during the period of January 1999 to November 2001. The horizontal axis is the community-level percentage of African-Americans. Arrest rate is number of arrests per 1000 residents, age 18 and over. There are 53 communities in the City of Cincinnati. Community C.B.D. is dropped from the graph as its black percentage from two alternative data sources produce dramatically different values. Community Over-the-Rhine, where the fatal shooting occurred, is an extreme outlier in terms of drop in arrests. Both are omitted from the figure, but are included in all other statistical analyses.

Figure 5: Citations or Arrests for Traffic Law Violations, 2000--2003



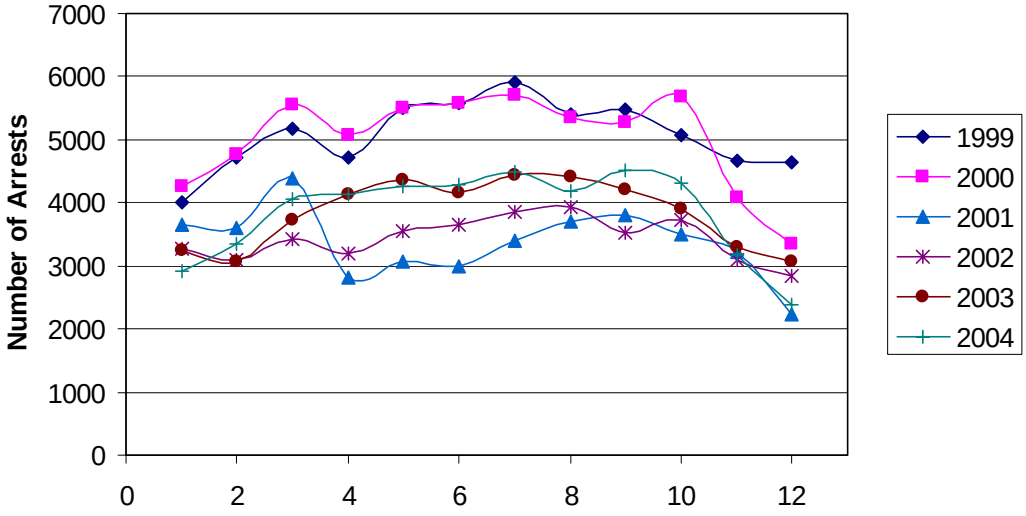
Data are city-level yearly citations or arrests for traffic law violations. Auto accidents investigated are plotted as a reference to the city's traffic situations. All items are indexed to equal 100 in 2000. All data are from executive summaries of Cincinnati Police Department operations, published annually.

Figure 6: Felony Crime, 1999--2001



Data are city-level monthly felony crime during the period of January 1999 to November 2001. Felony crime includes violent crime (murder, rape, robbery, and aggravated assault) and property crime (burglary, motor vehicle theft, and larceny-theft). All data are based on incident-level crime reported to the Cincinnati Police Department.

Figure 7: Arrests for Felony and Misdemeanor Crime, 1999--2003



Data are city-level monthly arrests for sum of felony and misdemeanor crime during the period of January 1999 to December 2003 (except December 2001). Felony crime includes violent crime (murder, rape, robbery, and aggravated assault) and property crime (burglary, motor vehicle theft, and larceny-theft). Misdemeanor crime includes drug-law violations, disorderly conduct, liquor-law violations, domestic violence, etc. All data are based on incident-level arrests recorded by the Cincinnati Police Department.