ABSTRACT

Title: ASSESSING THE CITY-LEVEL IMPACT OF DRUG COURTS ON CRIME RATES, 1985-2000.

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Drug court effectiveness is widely debated within the literature. Numerous evaluations of individual drug courts have been conducted, however, only recently has a consensus begun to emerge about the effectiveness of the drug court model in reducing recidivism and future drug use among participants. The purpose of this study is to assess the effectiveness of the implementation of drug courts in reducing drug-related crime. This analysis will add an additional level of understanding about the value of drug courts by examining the possible effects a city can attain by implementing a drug court. In this research, I tested whether cities with drug courts have significantly lower crime rates for drug-related offenses than similarly sized cities with comparable crime rates without drug courts. The results indicate that as a group, drug courts do not significantly reduce drug-related crime, however, some drug courts show promise for significantly reducing certain types of crime.

ASSESSING THE CITY-LEVEL IMPACT OF DRUG COURTS ON CRIME RATES, 1985-2000.

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Arts
2005

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Acknowledgements

I would first like to thank Gary LaFree for all of his time and work to support me in this project. I would also like to thank John Laub, Denise Gottfredson, and Brian Johnson for all of their help and understanding while I struggled through the research process. Finally, I am indebted to Doug Smith for his many hours of assistance and patience while we worked to recover this project from a fatal flaw. His insight and influence on future generations of criminologists will be greatly missed.

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Chapter 1: Drug Courts in the United States

Whether or not drug courts work is a widely debated question within the literature. Numerous evaluations of individual drug courts have been conducted, however, not until recently has a consensus begun to be reached among scholars about the effectiveness of the drug court model in reducing future drug use among participants (Wilson et al., 2005). The available research on the effectiveness of drug courts has generally focused on local evaluations of drug court programs. Among these existing evaluations, many are lacking in rigorous empirical analysis. The purpose of this study is to assess the effectiveness of the implementation of drug courts in reducing drug-related crime in cities with drug courts. Drug-related crime, for the purposes of this study, is defined as "Offenses to which a drug's pharmacologic effects contribute; offenses motivated by the user's need for money to support continued use; and offenses connected to drug distribution itself" (ONDCP, 2000:1). This analysis will add an additional level of understanding about the value of drug courts by examining the possible crime-reducing effects a city can attain by implementing a drug court.

This paper will begin with an introduction that will set out the goals of this study as well as the inclusion of a discussion of why this type of assessment of drug courts is important and how it can add to the existing body of literature. A brief description of a popular theory of why drug courts work and the state of drug courts in the United States will also be included in this section.

Introduction

This study will evaluate the effects of the implementation of drug courts in cities by evaluating drug-related crime rates. Drug courts have garnered considerable attention within the last decade and have been popularized within American society and the political arena (Nolan, 2001). General social sentiments have approved of the drug court alternative adjudication method to the extent that the model has started to be used for other offenses such as domestic violence and drunk driving (Goldkamp, 1993). With the spread of the drug court model, further rigorous empirical research is needed to truly understand the effects of drug courts on drug use and recidivism rates. This study attempts to provide new insights into the evaluation of drug courts and to add a more accurate assessment of the effectiveness of drug courts, by using annual data from 1985 to 2000 from numerous cities across the country. Previous research (e.g. Belenko, 2001; Gottfredson et al., 2003a; Spohn et al., 2001; Goldkamp et al., 2001; Roman et al., 2003) has also focused on the influence of drug court programs on participants by examining individual recidivism rates or drug use. This study expands on these previous studies by looking at whether drug courts have any impact on the cities in which they operate through a reduction in crime rates. Due to the rapid expansion of the drug court model in the United States, it is important to strive for a better understanding of its effectiveness in reducing crime.

Since the first drug court was implemented in Miami, Florida in 1989, the national and local attention given to these programs, and their participants, has grown substantially. The combination of various structural and cultural pressures during the late 1980s produced an environment ripe for a major change in the adjudication

process of drug offenders. With the spread of the drug court model both in scope and to other areas of criminal offending, such as driving under the influence/driving while intoxicated, prostitution, domestic violence, and petty theft (Goldkamp, 1993), further rigorous empirical testing is needed to better understand the effects of drug courts on reducing drug-related crime.

This study provides a new evaluation of drug courts by using time series data from thirty-four cities across the United States. As far as I am aware, no previous researchers have attempted to use Uniform Crime Report (UCR) data in assessing the effectiveness of drug courts. This study offers a new way of looking at drug courts and provides an alternative to the traditional methods of evaluating the success or failure of drug courts. The sheer number of drug courts in the United States, and the amount of government funding they receive, is an impetus to strive for a better understanding of this phenomenon. This study will examine the possibility that drug courts can have an additional effect beyond the aggregation of the individual-level effects that have been found in previous research. Prior published studies of drug courts have focused on individual drug courts (e.g., GAO, 1997; Gottfredson et al., 2003a; Finigan and Carey, 2002), individual effects on drug court participants, and recidivism rates (e.g. Belenko, 2001; Gottfredson et al., 2003a; Spohn et al., 2001; Goldkamp et al., 2001; Roman et al., 2003). While these are important aspects in the evaluation of drug courts, it is also important to consider the community as a whole and the impact that drug courts may have on overall crime rates in a city. Knowing the effects of participation on individuals is important, however, it is the overall crime

rate that may be of greatest interest to policy makers. This study is a first attempt at determining if drug courts are capable of influencing city-level crime rates.

There are a few possible forms that the drug court implementation and crime rate relationship can take. The findings from this study can show that there is a total and consistent effect of drug courts on crime rates, that there is a total and consistent lack of effect on crime rates, or that there are some cities in which there is a drug court effect and others where there is no effect. These different results are possible based on the mechanisms through which drug courts operate. The all or nothing effects would result from the mere presence or absence of drug courts being a significant influence on crime rates. The finding that some drug courts are effective while others are not may be a function of the structural characteristics of the drug court or the city.

Drug courts operate within the larger criminal justice system structure of a city. While the development of drug courts was largely a reaction to specific problems encountered in the adjudication of offenders through traditional criminal justice means and is therefore a policy-driven solution, some criminological theories such as deterrence, social control, social learning, and life course theories can help us evaluate the effects of drug courts. Although these theories are primarily focused on explaining the prevailing causes of crime among all offenders, they are still applicable to drug and drug-related offenses and offenders.

One of the most prominent criminological theories that may best explain why drug courts work is social learning theory. Social learning theory in many ways developed out of Edwin Sutherland's differential association theory (Williams and

McShane, 1999). Social learning theory evolved out of behavioral psychology roots and is focused on the effects of reward and punishment on individual behavior. The learning process is shaped and modified by the consequences of behavior as well as the process of modeling or imitation. Therefore, behavior is maintained if reinforced or rewarded by society or if an individual observes someone else being rewarded for that behavior.

Social learning theory (Akers, 1977) is relevant to the function of drug courts, since drug courts attempt to provide a structure of rewards and punishments to reinforce non-drug using and non-offending behavior and to strengthen law-abiding behavior. The drug court milieu also offers direct interactions with the environment that allow the primary mechanisms for the learning of normal, or socially acceptable, behavior to occur (Vold et al., 2002; Lilly et al., 2002). Drug courts also remove the offender from the general prison population where other criminal behavior can be learned and rewarded by other criminal offenders.

Social learning theory suggests that once drug court participants have learned the values and norms of law-abiding behavior, they can then become examples for others from which to learn. Additionally, drug use can be an addictive behavior and therefore provides the user with rewards for continuing the behavior. Social learning theory also provides an explanation for how drug courts can interrupt that cycle of reward and punishment surrounding drug use and can provide the offender with an alternative structure for rewards and punishments.

In the past fifteen years the popularity of drugs courts has increased exponentially. The number of drug courts in existence more than tripled between

1997 and 2001 alone (U.S. General Accounting Office, 2002). According to the Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project (2003), at the end of 2001, there were 1093 drug courts actively operating within the U.S., and an additional 414 in the planning process as of November 2003. Of these active drug courts, 696 were adult-specific. The remaining 397 were juvenile or family drug courts.

Drug courts can be found operating in all 50 States, the District of Columbia, Guam, and Puerto Rico (Bureau of Justice Assistance (BJA), 2003). The quantity of drug courts either in operation or in the planning phase shows that the momentum behind the drug court phenomenon has still not waned. This momentum is also evidenced by the amount of funding that has been provided to drug court initiatives at the federal, state, and local levels. At the Federal level, budgetary support has increased significantly over the years. Beginning in 1995, the Drug Courts Program Office issued $12 million in grants; President Clinton increased this figure throughout his administration to $13 million in 1997 and then to $40 million in 1999; and, in 2001, President Bush allocated $50 million in his budget to drug courts (Nolan, 2002a).

Despite the widespread support and general acceptance of the effectiveness of drug courts in reducing recidivism and drug use among participants, few careful evaluations of drug courts have been conducted (Wilson et al., 2005; Gottfredson et al., 2003a; Belenko, 2002). Goldkamp notes "… it may be the collective weight rather than the rigor of existing studies that leads us to accept the notion that drug courts can indeed 'work'" (2003:198). The research that is available is even further

deficient in stringent analyses of *long-term* influences of drug court participation on crime rates (BJA, 2003). To this point, there have been no longitudinal studies conducted on the effectiveness of drug court implementation on reducing city-level crime rates. Researchers have observed that of the available drug court studies, most have serious methodological limitations including a lack of control groups, or comparison of unmatched treatment and control groups in post-test only designs (Gottfredson et al., 2003a; Belenko, 2001). Other evaluations that assessed the outcomes between participants who graduated against non-graduates could only conclude that "successes succeed and the failures fail" (Goldkamp et al., 2001:32; Gottfredson et al., 2003a).

Chapter 2 of this paper is divided into two sub-sections. The chapter begins by discussing the development of drug control efforts in the United States and the establishment of the drug court model. Also included in this section of Chapter 2 is a discussion of the impact that the influx of drug offenders into the criminal justice system had on the development of the drug court model. Chapter 2 concludes with a summary of the structure of drug courts, previous evaluations of drug courts, and how the relationship between drugs and crime is important in the assessment of the impact of drug court implementation on city-level crime rates.

Chapter 3 provides an overview of the methodology used in this study. A summary of the data used, the methods, and data analysis is included. Results from the data analyses conducted are presented in Chapter 4. Finally, a discussion of these results and conclusions including limitations, future research, and policy implications are offered in Chapter 5.

Chapter 2: The Drug Court Movement

Drug Control Efforts

The following section provides a description of the underlying sets of values present throughout the development of drug control efforts in the United States and how the presence of these values at various stages in these efforts led to the growth of the drug court model. This section introduces the dominant perspectives seen throughout the evolution of drug control in the United States. Included is a discussion of how the drug court model can operate within each of these perspectives and their relative influence on the development of drug courts.

Federal Drug Control Efforts in the United States

Nolan (2005:15) argues that the interplay between, and dominance of one of three separate "legitimizing values" or "moral understandings" has shaped drug control policy in the United States. He identifies these values as (1) the moral or religious perspective, (2) the utilitarian perspective, and (3) the therapeutic paradigm. These perspectives operate in shaping how drugs, their use, and addiction are dealt with by various social institutions including the political, legal, and medical fields.

Within the first of these legitimizing values, the moral or religious perspective, the use of all drugs is morally wrong, and represents the weakness or evil of a person's character. Drug use is a rational act, where continued use would be seen as negligent behavior and lead to further immoral behavior and character degradation. The moral or religious perspective fits under the ideas of the protestant ethic. Becker (1966) observed that under this legitimizing value, people are expected to be

completely in control of themselves and are responsible for their behavior. Substance use is responsible for the loss of control and is therefore seen as evil. According to Nolan (2001), this perspective has widely influenced public views and perceptions of drug use in the United States.

It was during an era predominated by the moral perspective that the federal government began their involvement in drug control. The involvement of the federal government in the control of drugs within the United States did not become a major priority until fueled by international events in the late 1800s with the United States acquisition of the Philippines (Morgan, 1981; Musto, 1987). Many of these events revolved around the opium trade. Domestically, the growing call for legislative involvement resulted from moral concerns, due to growing rates of immigration to the United States, and a desire among the upper class to return to the prevailing morals of the time (Nolan, 2001).

The federal government's involvement in domestic drug control was solidified with the passage of the Harrison Act in 1914. The implementation of the Harrison Act was, in essence, a manifestation of the prevailing moral values of American society at the time and shifted control of drugs from the medical community to law enforcement (Belenko, 2002). The passage of these laws exemplified the federal governments influence by the predominating moral values of the time.

The second legitimizing value, which, according to Nolan (2001), has been successful in shaping legal views and popular perceptions of drug use, is the utilitarian perspective. According to this value, drug use hinders "…the efficient and productive capacities of a modern capitalist society" (Nolan, 2001:16). Drug use,

therefore, is solely based on one's desire for pleasure and the pursuit of this pleasure is costly to society. The utilitarian perspective is a recurrent theme in the debate about drug policy stemming back to the fight of pharmacists against the regulation of opiates, largely due to drug companies' economic dependence and profit seeking outlook (Burnham, 1993). The utilitarian perspective has been dominant in the development of more legalistic views surrounding the control of drugs and drug offenders (Nolan, 2001).

During an era predominated by the utilitarian perspective, the involvement of the federal government in the control of drugs in the United States grew substantially. After the passage of the Harrison Act, federal and state drug laws continued to become stricter and there was a greater call for harsher penalties for drug offenders. The purely legalistic perspective on drug control peaked during the post-World War II era. This pinnacle of the legal control of drugs was reflected in the approval by Congress of the Narcotics Drug Control Act in 1956 (Nolan, 2001). This legislation increased the penalties for the sale and possession of drugs and allowed narcotics officers to carry firearms.

The third legitimizing value, identified by Nolan (2001), is the therapeutic perspective. In this value system, drug use is seen as a disease that can be cured with the proper treatment. Throughout history, the forms of treatment have taken on both physiological and psychological manifestations. Throughout the nineteenth and beginning of the twentieth centuries this legitimizing value shaped the treatment of drug addicts and is illustrated in the use of physical remedies to try to cure drug addiction (Nolan, 2001). This view has predominated the shaping of social control of

drug use within society. Recently, there has been a shift in popular beliefs that more closely fits with the therapeutic paradigm and, as I will discuss below, this shift in public perceptions was a major factor in the development of drug court.

The emergence of the therapeutic perspective began with the first major blow to the legalistic perspective of drug control in 1962 with the U.S. Supreme Court decision rendered in *Robinson vs. California*. The U.S. Supreme Court ruled that it was not a crime to be addicted to drugs (307 US 674). This ruling overturned a California law that made it illegal to be addicted to narcotics, where conviction could be punishable by imprisonment. In his opinion, Stewart held that, "the [California] statute inflicts a cruel and unusual punishment in violation of the Eighth and Fourteenth Amendments" (307 US 674). This opinion by the U.S. Supreme Court reintroduced the idea of drug addiction as a disease, but did not remove the need for legislative control. In fact, this decision strengthened the use of confinement as a mechanism of mandatory treatment that can be justified in terms of protecting society. Congress further solidified this position with the passage of the Narcotic Addict and Rehabilitation Act in 1966. This piece of legislation "gave the courts statutory authority to commit drug offenders *involuntarily* to residential and outpatient treatment programs as an alternative to incarceration" (Nolan, 2001, emphasis added).

Even though these three legitimizing values have shaped drug control policy in the United States, it is possible to argue that drug courts could operate within any of the frameworks. Under the moral perspective, drug courts could be a method to hold drug offenders personally responsible, not only for their criminal behavior and

desistance from it, but would also make them accountable for their drug use and addiction. This differs from the therapeutic paradigm, in that within the therapeutic framework, drug addiction is considered a disease and typically users are not held accountable for the decision to begin using drugs in the first place. Additionally, within the moral perspective drug offenders are thought to commit crimes due to this initial moral failing (Shell, 2002). If drug court participants are forced to deal with and come to terms with their own moral weaknesses, and the root of all the other criminal behavior is dealt with, they have a better chance of success than a typical non-drug addicted offender (Shell, 2002).

Drug courts can also be conceptualized from the utilitarian perspective. A drug court can be designed with the objective of forcing participants to deal with their inability to put the greater good of their community over their pursuit of immediate gratification. This could be taught through the importance of a stable society and the value of hard work over the prospects of immediate gratification. However, due to public perceptions about the operation of drug courts and the severity of actual punishment (or lack thereof) for drug court participants, it is during a time of greater support for the therapeutic paradigm that drug court programs garnered the most support and have grown the most substantially (Nolan, 2001).

Closely linked to Nolan's (2001) idea of the therapeutic perspective is the concept of therapeutic jurisprudence. Hora et al. (1999) designate therapeutic jurisprudence as one of the justifications for the use of drug courts in the processing of drug offenders. While Nolan's therapeutic perspective describes more of an underlying set of values shared by a group that influences how people think about

drug use and addiction, therapeutic jurisprudence is the mechanism through which those values enter into the criminal justice system.

Therapeutic jurisprudence is a fairly new concept that didn't appear until the late 1980s and can be defined as a "study of the extent to which substantive rules, legal procedures, and the roles of lawyers and judges produce therapeutic or antitherapeutic consequences for individuals involved in the legal process" (Hora et al., 1999:441). According to Rosenthal (2002:154), therapeutic jurisprudence not only addressed the question of "why punish?" but also "how to punish" or "how to regulate or detain." The adoption of a new judicial practice, as occurred with the development of drug courts, represented a major shift in the link between treatment and criminal justice practices (Belenko, 2002). Under the therapeutic paradigm, part of a judge's mandate is to advance the interests of the offenders, while satisfying the need for adjudication and punishment, based on empirical evidence (Harrell, 2003). The acceptance of therapeutic jurisprudence into the criminal justice system initiated the development of what would become the drug court model. These precursors to drug courts will be discussed in the following section.

Establishment of the Drug Court Model

Several court diversion programs were a precursor to drug courts. These programs served as a link between the legal perspective and the medical community. The federal government used civil commitment programs to divert certain low-level offenders from the adjudication process into treatment programs (Belenko, 2002). Treatment Alternatives to Street Crime (TASC) Programs were implemented beginning in 1972, in connection with the Law Enforcement Assistance

Administration (BJA, 1992). TASC Programs also served to remove offenders from the traditional adjudication process and into treatment programs, but did not necessarily mandate commitment. Nolan (2001) recognized many of the ways that TASC programs logically led to the development of drug courts. These programs were partly in response to the growing demand placed on the criminal justice system due to the increasing severity of federal drug laws.

Diversion programs removed many low-level drug offenders from the overloaded criminal justice system. Compensation of participants in these programs was common for successful completion in the form of dropped charges or having their arrest record expunged. Most importantly, TASC played a crucial role in the development of a relationship between the criminal justice system and treatment options for the future of the social control of drugs in the United States (Nolan, 2001). One important difference between TASC programs and drug courts, Nolan (2001) notes, is that TASC administered treatment separately from the adjudication process. Within the current structure of drug courts, as they have been implemented in the United States, treatment and court processing are fully integrated.

While the severity of criminal justice sanctions increased dramatically before, and continued through, the emergence of TASC programs, the "War on Drugs" (a heightened law enforcement effort in the 1980s of drug laws and the establishment of stricter policies geared toward drug supply and demand in the United States) and the crack cocaine epidemic of the mid-1980s compounded the issues faced by the criminal justice system. The "War on Drugs" resulted in the passage of numerous strict drug enforcement laws including the Comprehensive Crime Control Act in 1984

and the Anti-Drug Abuse Acts in 1988. These crime control efforts were largely rooted in the philosophy of deterrence (Spohn and Holleran, 2002). The stricter enforcement of drug laws and stiffer penalties for drug law violators coupled with the proliferation of the crack cocaine epidemic, particularly in large American cities, created a situation that the current criminal justice system was ill-prepared to handle. These drug control efforts stressed the use of harsh punishment and emphasized severity over certainty. Subsequently, many of the drug control policies and laws were overly severe and the punishment exceeded the harmfulness of the crime, such as for many drug possession violation laws.

At the time drug courts began to appear in the United States, a combination of structural and cultural pressures created a unique environment that was ideal for their development. The predominate structural causes often cited by scholars in producing major social change, are conventional social variables such as economics, political opportunities, and available resources (Nolan, 2001). While these variables may be at least partially responsible for the development and growth of the drug court model, more specific structural pressures can also be identified. Some of these pressures include the increase in the arrest rates of drug offenders, as a product of the "War on Drugs" policies, and high recidivism rates among these offenders (Gottfredson et al., 2002; Belenko, 2001; Nolan, 2001). These increased pressures on the criminal justice system resulted in increased court caseloads and overcrowded jails and prisons and subsequent adjudication and imprisonment costs. These forces alone created pressure to develop alternative methods of adjudicating the growing population of drug offenders with specialized needs.

As apparent as the need for serious structural change was in the criminal justice system, a restructuring of such magnitude would not have been possible without a shift in cultural/moral perspectives of the greater society (Belenko, 2002). During this period there was an "advancement of the therapeutic culture – typified as it is by an elevated concern with the self, by a conspicuously emotivist form of disclosure and self-understanding, by a productivity to invoke the language of victimhood and to view behaviors in pathological rather than moral/religious terms" (Nolan, 2001:47). According to Nolan (2001), the renewal of the therapeutic perspective became the underlying guiding principle for the development of the drug court model.

The change in the philosophy of the adjudication of drug offenders has been supported by findings that treatment, rather than incarceration, is an effective means of reducing drug use and recidivism among drug offenders (DHHS, 2000; 1994; Anglin and Hser, 1990; Spohn et al., 2001; Dynia and Sung, 2000). Research has found that treatment is effective at reducing drug use and correlated negative behavior, with the most effective being programs that are specifically suited to the individual (DHHS, 2000; 1994). Anglin and Hser (1990) provide a good summary of the research support for the use of drug abuse treatment in reducing both drug use and drug-related crime. Evaluations have also found that participants in drug treatment court programs had significantly lower rates of recidivism than their traditionally adjudicated counterparts (Spohn et al., 2001; Dynia and Sung, 2000). While some claim that there is a risk of removing these offenders from the confines of the prison, empirical findings support the fact that diverting drug offenders out of prisons does

not provide a greater risk to the community and is at least as safe as traditional methods (Dynia and Sung, 2000).

Drug Offenders in the Criminal Justice System

Aggressive enforcement of drug legislation initiated by the "War on Drugs" has brought an overwhelming number of drug addicted offenders, as well as low-level, non-addicted drug offenders, in contact with the criminal justice system. Low-level drug offenders are typically those cited for minor drug law violations, such as marijuana possession. As shown in Table 1, over 80 percent of arrests for drug abuse violations are for possession and equal approximately 1.25 million arrests. According to the Bureau of Justice Statistics (2004), the total adult drug arrests increased from 322,300 in 1970 to almost 1.5 million in 2003. This influx of mostly low-level, or non-serious and non-violent drug offenders has placed considerable pressure on the criminal justice system, in the form of overloaded court dockets and overcrowded jails and prisons, and has put a strain on the resources of criminal justice agencies (Belenko, 2002; BJA, 2003). According to the Uniform Crime Report (UCR), in 2002, estimates for arrests for drug abuse violations were over 1.5 million, and together with arrests for driving under the influence accounted for 21.8 percent of all arrests (Federal Bureau of Investigation (FBI), 2002).

According to Belenko (2000), 79% of all adult arrestees test positive for drugs, have used drugs recently, or reported a history of substance dependence or treatment, for all crime types. These numbers represent the burden faced by the criminal justice system in dealing with this group of offenders. According to the Bureau of Justice Statistics (1999) there was nearly a 500% increase in the number of

prisoners in the state and federal systems between 1975 and 1999, from less than 250,000 to almost 1.3 million. Spohn et al. (2001) credited this large growth in the prison population to the increasingly strict enforcement and penalty structure for drug offenses.

Table 1: Arrests for Drug Abuse Violation Percentages (N = 1,538,813)

Drug Abuse Violations	United States Total
Sale/Manufacturing (N = 303,146)	**19.7%**
Heroin or cocaine and their derivatives	8.8%
Marijuana	5.4%
Synthetic or manufactured drugs	1.4%
Other dangerous non-narcotic drugs	4.0%
Possession (N = 1,235,667)	**80.3%**
Heroin or cocaine and their derivatives	21.3%
Marijuana	39.9%
Synthetic or manufactured drugs	3.0%
Other dangerous non-narcotic drugs	16.0%

Source: adapted from the FBI Crime in the United States: Uniform Crime Reports, 2002.

The Search for Alternative Adjudication Methods

The huge influx of drug offenders into the criminal justice system pushed justice personnel to look for alternative methods of processing the large number of offenders entering the system. At the same time that the logistical need to deal with the growing number of drug offenders entering into the adjudication system became an important issue, there was an underlying paradigm shift toward a "therapeutic jurisprudence" model for dealing with these offenders. As described by Belenko "despite [the] long history of criminal justice-based drug user treatment, the structure, design, and underlying philosophy of drug treatment courts represent a dramatic shift in jurisprudence and treatment-criminal justice linkages" (2002:1638). Earlier

periods of drug offender adjudication emphasized a moral or utilitarian perspective, whereas the change to the drug court model marked the use of more therapeutic approaches in the processing of drug offenders.

Overcrowding within the criminal justice system was not the only spark that ignited the growth of the drug court model. Many criminal justice officials became tired of the traditional ways of adjudicating drug offenders due to the low success rates of these methods and the inability to prevent recidivism among this class of offenders (Spohn and Holleran, 2002; Nolan, 2002b). Not only had the use of traditional adjudication methods been found to be ineffective, Spohn and Holleran (2002:329) also concluded that "imprisonment has a more pronounced criminogenic effect on drug offenders than on other types of offenders", possibly increasing a drug offenders likelihood of recidivism. This is also supported by the fact that researchers have found drug offenders to have higher recidivism rates than other offenders (Spohn et al., 2001; Spohn and Holleran, 2002; Kruttschnitt et al., 2000; Visher and Linster, 1990).

The criminogenic effect of imprisonment and the higher recidivism rates of drug offenders may play a key role in how drug courts can impact the overall crime rates in a city. If drug offenders are responsible for committing a large portion of all drug-related crimes in a city, removing them from the cycle of offending should have an impact on the overall crime rate. By removing drug offenders from the traditional adjudication process, they are also removed from contact with other offenders in a prison setting where criminal knowledge proliferation may take place.

Development of Drug Courts

As the need for an alternative adjudication method gained ground, the drug court model flourished. While there was no regulation on how drug courts must be structured or operate, many follow the same functional form. The following sections cover how drug courts have developed. The first section includes the main structures of drug courts and many of their common characteristics. The second section covers some of the main findings from drug court evaluations. The final section discusses the drug crime link and how drug courts can influence crime rates for drug-related crimes.

Structure of Drug Courts

The design of drug courts was in part to interrupt the revolving door process that adjudication through the traditional justice system created (Spohn et al., 2001; Kruttschnitt et al., 2000). Drug courts create a direct link between the judge and the offender. The actual structure and workings of drug courts may vary by court (Drug Court Clearinghouse and Technical Assistance Project; 1995; 1999). However, the basic workings of drug courts generally have the same foundation; usually requiring the offender to be under the direct supervision of a judge, undergo regular drug testing, and participate in treatment and various other programs and methods to target the fundamental causes of their criminal behavior (Longshore et al., 2001:7). According to the 1997 Drug Court Survey Report (Cooper, 1997a) drug courts have reported three main objectives for their programs: 1) reduce recidivism; 2) reduce substance abuse; and 3) enhance the likelihood of the participants' rehabilitation.

Defendants targeted for drug court programs are typically lower-level, or non-violent offenders, whose primary connection with the criminal justice system is related to their substance addiction (Drug Court Clearinghouse and Technical Assistance Project, 1995). Some programs defer the adjudication of offenders; other programs complete the adjudication process before an offender enters the program, while still others allow participants to enter the program after a plea is entered, but before the adjudication process is complete (GAO, 1997; 2002). More generally, the programs fall into one of two classification categories: diversionary programs or post-adjudication programs. Diversionary programs remove the offender before adjudication takes place or a plea is entered, and usually is an effort to remove the stigma attached to being processed in the criminal justice system. Post-adjudication programs occur after the offender has been officially processed through the criminal justice system and are usually after a guilty plea is recorded. A key underlying goal of the drug court design is "to increase the likelihood that drug-addicted offenders will seek and persist longer in drug treatment, which is expected to help these individuals reduce their drug dependence and develop healthier, more productive, and crime-free lifestyles" (Gottfredson et al., 2003a).

Once in the program, participants are subject to a variety of different monitoring and supervision mechanisms. Conditions of participation often include frequent drug testing, regular hearings with a judge, and enrollment in various treatment programs (Gottfredson et al., 2003a; Nolan, 2001). Participants typically progress through various stages of the program until completion, or graduation. The frequent meetings with the judge allow for closer monitoring of the participants'

progress. These frequent hearings provide the judges with opportunities to offer praise, issue warnings or sanctions in order to help keep the participant on a crime-free path (Gottfredson et al., 2003a).

Even with empirically based support for the alternative adjudication of drug offenders, the structure of drug court programs can be seen as too soft on crime, and as letting participants off too easily. Public perceptions that there is a dichotomy between treatment and punitive sanctions fuels criticisms of drug courts. However, many drug court administrators argue against these criticisms, asserting that often involvement in the drug court program is harsher than traditional imprisonment (Nolan, 2001). Drug courts actually provide the criminal justice system the unique opportunity to cross the boundary between penal and therapeutic styles of social control, and that in fact, "social control in the drug court is at the same time both therapeutic and penal" (Nolan, 2001:52). Another common criticism is that implementation of drug courts cause net-widening. Net-widening occurs when the intervention is applied to a larger population than was initially intended to receive the treatment. This can result in wasted resources, and possibly the biasing of results from evaluations, because the proper population was not targeted. In the instance of drug courts, if net-widening occurs, the population that is being diverted into the program are low-level first time offenders, who otherwise would have not received a serious sanction.

The structure of the drug court may play an important role in how effective the drug court is in reducing recidivism and substance use of its participants. A 1997 publication titled Defining Drug Courts: The Key Components by the National

Association of Drug Court Professionals (NADCP) has been significant in establishing a standard for the implementation and operation of drug courts and provides benchmarks against which drug courts can be evaluated. All the drug courts selected for this study met the requirements set by NADCP to be considered "bona fide" drug courts.

It is unknown whether the drug courts included in the study all contain the same structural characteristics. However, they do all contain the key components outlined in the NADCP (1997) report. Additionally, all of the drug courts were included in a 1997 GAO report assessing the state of drug courts in the United States, with the purpose of evaluating their growth, characteristics, and results. Furthermore, most of the drug courts included were part of a Drug Court Clearinghouse and Technical Assistance Project (1999) study that reported on a variety of structural characteristics of drug courts. While it is not an exhaustive study of all drug court structural characteristics, it does allow for some comparison of the similarity or difference between drug courts. Most of the drug courts included in the study share many of the same characteristics. In fact, the largest variation between drug courts appears to be the population served by an individual drug court. Although this figure can range from 150,000 to over 1 million, Cooper found that the size of a drug court does not impact its effectiveness, and that "drug courts in large metropolitan areas (e.g., with populations over 750,000) appear to retain participants at a rate similar to drug courts in smaller jurisdictions with populations under 200,000 and in rural areas" (1997a:5).

The number of participants that enter the drug court program in a city may play an important factor in that drug court's ability to impact crime rates. If a small drug court is operating in a large city, it is unreasonable to expect that a low ratio of drug court participants to population served will be able to influence overall crime rates in a city. However, according to Roman (2003), over 50% of drug courts operating in the United States today have greater than 250 graduates annually, with a quarter of all drug court having over 500 graduates each year. According to a Statewide Survey of Drug Court Directors, in states that responded, there are currently over 70,000 drug court participants at any given time (Roussell, 2005). Additionally, according to Roussell, budgeted caseload capacity can range anywhere from 100 in small towns to in the thousands in large cities as in Hennepin County, MN with over 3600 active participants, and 2600 participants in Fort Lauderdale, FL.

While large and small drug courts may be equally effective in retaining participants and reducing violations while participants are in the program, Roman et al. (2003) found that recidivism rates varied widely depending on the size of the drug court. The results from their study indicated that drug courts serving larger populations had higher recidivism rates. However, they also found that the locations of these drug courts were in more urban settings and the programs were generally targeting a harder to reach population with more serious levels of offending and drug use. The authors concluded that these results did not indicate that these drug courts were less effective. In fact, they concluded that, although the recidivism rates were higher for the larger drug courts, they were targeting a population with a more severe

offending history and the total number of crimes reduced may actually be larger for those cities.

Certain structures inherent in both the drug court and the city in which the drug court operates may influence recidivism rates of both participants and graduates. These structures include "…characteristics of their participants (i.e., in the severity of their addiction, the types of drugs used, and their criminal history) and in how the drug courts operate (i.e., program eligibility, treatment availability and quality, and court monitoring policies)" (Roman et al., 2003:1). Currently, no empirical study has been conducted evaluating a drug court that examines the influence of these characteristics on the effectiveness of drug courts. So while these are important factors influencing the effectiveness of drug courts, the magnitude of this effect is unknown.

Evaluations of Drug Courts

The outcomes of evaluations of the drug court experience have generally been favorable. While the overall literature generally lacks strict empirical analysis, those few studies that have used rigorous research designs have generally found that drug court participation reduces drug use as well as recidivism rates (Belenko, 1998; 1999; 2000; 2001; Gottfredson et al., 2003a; Wilson, 2005; Goldkamp et al., 2001; 2003). The implementation of drug courts has also been found to reduce the operating costs in adjudicating drug offenders (Hora et al., 1999).

However, despite these encouraging findings, controversy still exists in the field about whether drug courts actually influence recidivism and repeated drug use of participants. This conflict is illustrated by the views of some researchers who have

found that the effectiveness of drug courts is readily apparent and has been documented (Meyer and Ritter, 2002), while others that have argued that there is no sound empirical evidence to support the conclusion that drug courts work (Anderson, 2001; Hoffman, 2002). A recent meta-analysis of 42 existing evaluations of drug courts concluded that "the overall findings tentatively suggest that drug offenders participating in a drug court are less likely to reoffend that similar offenders sentenced to traditional correctional options" (Wilson et al., 2005:2). Regardless of whether drug courts have been proven to be effective, drug use among offenders remains high. According to the 2000 Arrestee Drug Abuse Monitoring (ADAM) Program report, drug use among adult, male arrestees continued to be common (NIJ, 2003). The data indicate that among the thirty-five ADAM sites that participated in the 2000 data collection[1] half reported that at least sixty-four percent of adult, male arrestees tested positive for at least one of five drugs: cocaine[2], marijuana, opiates, methamphetamine, or PCP (phencyclidine). The drugs most commonly detected through urinalysis were: marijuana, cocaine, opiates, and methamphetamine, respectively.

The Drug Court Clearinghouse and Technical Assistance Project (1999) summary report on the status of drug courts concludes that drug court participants experience a significant decrease in drug use when compared to non-participants, and are significantly less likely to recidivate when compared to other offenders arrested

[1] These cities include: Albuquerque, Anchorage, Atlanta, Birmingham, Chicago, Cleveland, Dallas, Denver, Des Moines, Detroit, Ft. Lauderdale, Houston, Indianapolis, Laredo, Las Vegas, Los Angeles, New York City (Manhattan), Miami, Minneapolis, New Orleans, Oklahoma City, Omaha, Philadelphia, Phoenix, Portland, Sacramento, St. Louis, Salt Lake City, San Antonio, San Diego, San Jose, Seattle, Spokane, Tucson, and Washington, DC.

[2] The drug testing technology used did not distinguish between crack and powder cocaine.

for drug possession. These findings have been supported by recent reviews of drug courts (Belenko, 1998; 1999; 2001; Gottfredson et al., 2003a; Goldkamp et al., 2001). However, there has been no previous study that examines how drug courts impact the overall offense rates of a city. Results from this analysis will be important in understanding the magnitude of the effect that drug courts have at the city level. The findings from this study can add to the existing literature that has focused primarily on the impact of drug courts at the individual level.

Drugs and Crime

The relationship between drugs and criminal activity has been widely discussed in the literature. See Tonry and Wilson (1990) and MacKenzie and Uchida (1994) for in depth discussions of the drug-crime link. Research has shown a highly reliable positive correlation between drug use and crime in that there are "…high crime rates among drug abusers and high drug-use rates among offenders" (Hser et al., (1994:19). Further, offenders that are drug-dependent have been shown to have substantially higher crime rates and are responsible for a disproportionate amount of crime (Chaiken and Chaiken, 1982; Hser et al., 1994).

A widely accepted framework for classifying the drug-crime link was offered by Goldstein (1985). In his article, Goldstein provides three separate conceptual categories or models that can describe the drug-crime relationship: (1) the psychopharmacological model, (2) the economic compulsive model, and (3) the systematic model. While Goldstein's primary purpose was to explore the link between drugs and violent crime, his work has since been applied to all crimes (MacCoun et al., 2003). Goldstein suggests that the psychopharmacological effect is

produced when the ingestion of drugs leads to an impact on the user's behavior. Drugs that typically fall into this category are alcohol, stimulants, barbiturates, and PCP. While Goldstein is suggesting that there is something inherent in the use of some drugs that may affect behavior, he is not suggesting that there is a direct causal link between the ingestion of drugs and crime. The use of some drugs may cause irritability, excitement, or irrational behavior. Additionally, the physical and mental effects of withdrawal from drug addiction could influence behavior. According to Goldstein, the psychopharmacological effect may also play a role in the behavior of a victim, in that intoxication may impair a person's ability to defend his or herself. Therefore, the drug use may be only one of many influencing factors that predict criminal behavior, and a true psychopharmacological effect is probably rare.

The second conceptual category suggested by Goldstein (1985) is an economic compulsive effect. In this model the relationship between drugs and crime is driven by the expensive nature of purchasing drugs. Therefore, crime is a method of income generation to support a drug habit. Heroin and cocaine, due to their addictive nature and high costs, are the drugs most often associated with an economic compulsive effect.

The final category proposed by Goldstein is the systemic model. This model includes crimes that are an inherent function of being involved in the drug lifestyle and more specifically drug sales and dealing. Falling into this category are crimes involved in turf battles, retaliation, etc.

The models presented by Goldstein (1985) offer explanations of how different types of drugs and different motivations of offenders can play a part in the

commission of crimes. This logic also offers methods by which the implementation of drug courts can interrupt a cycle that exists between drug use and crime, and how by reducing the levels of drug use in a city, there can be a resulting decrease in the overall crime rate.

As discussed above, treatment of drug offenders has been shown to be effective in reducing future individual drug use. While there are still questions as to whether treatment is effective for all offenders (Hepburn, 1994), the general consensus is that treatment is more likely than traditional forms of adjudication to reduce future crime (Anglin and Hser, 1990; Spohn et al., 2001; Dynia and Sung, 2000). Fagan (1994) found that drug use and drug selling are stable forms of behavior and were not deterred by probation or prison based on rearrest rates.

Drug courts in the United States have experienced a large growth in popularity, which has been an impetus for the large numbers of drug courts both currently in operation and in the planning phases. The drug court model has gained this popularity with surprisingly little rigorous empirical study and evaluation. Additionally, little is known about the influence drug court implementation has at the city-level on drug-related crime rates. The next chapter describes the data and methodology used in this study to assess the city-level impact of drug courts on crime rates.

Chapter 3: Data and Methods

The following three sections of this chapter describe the methodology I used in the analysis of drug court implementation on crime rates. The first section discusses the data that was used to complete the longitudinal analyses of drug courts at the city-level. The second section includes explanations of the two types of analyses conducted: ARIMA analyses, and a fixed-effects panel model. The final section covers the data analyses conducted and specific operationalizations of key components of the model.

Data

I am proposing to examine the impact that drug courts have had on crime rates for drug-related offenses in cities. At the conceptual level, the dependent variable of interest is drug-related criminality among offenders. This variable is operationalized through the use of UCR data by examining the crime rates for drug-related offenses by city. Offenses I selected to include in the analysis are overall crime rate, property crime, robbery, burglary, larceny/theft, and motor vehicle theft. I chose these offense rates based on the Arrestee Drug Abuse Monitoring (ADAM) Program percentages of arrestees who test positive for illicit drugs for various offenses and the percentage of arrestees who reportedly committed their offense to obtain money to buy drugs (ONDCP, 2000).

I selected data from the UCR's Index of Crime, Metropolitan Statistical Areas for the years 1985 to 2000. Population and crime rate from the UCR's Metropolitan Statistical Areas were used based on the most appropriate population served by the

drug court (Cooper, 1997b). The Uniform Crime Reporting Program began in 1930 and is run by the FBI (Maltz, 1977). Police agencies from around the country voluntarily submit their crime data to the FBI and an annual report comprising this data is published, therefore, yearly data will comprise the time-series to be analyzed.

The independent variable in the analysis is the implementation date of a drug court in a selected city. The specific dates of implementation have been collected from the U.S. General Accounting Office (2002). Additionally, only adult drug courts were eligible to be selected for the sample. Only fully implemented adult drug courts operating during the appropriate timeframe will be included in the analysis.

I selected a total of 34 cities, 17 cities with drug courts and 17 cities without drug courts to use in the analysis. Selection of drug court cities was based on the following two criteria: the cities must have had only a single drug court implemented before 1995, without the addition of a second drug court before 2001; and the city must have had UCR crime rate data available for all years between 1985 and 2000 missing no more than one year in a row. As illustrated in Table 2, I selected control cities by matching the selected drug court cites on crime rate and population in 1985, the first year used in the time series. The cities included in the analysis were matched by the following three steps. First, I determined all eligible drug court cities by using the above criteria. Second, I calculated the range of acceptable range of variation[3] in both population and crime rate for all eligible cities. Third, matched were determined by comparing the population and crime rate for non-drug court cities to the calculated acceptable range. The 17 drug court cities that had an acceptable match were

[3] A 25 percent variation in population size and a 10 percent variation in crime rate were allowed in the matching process.

included in this study. Additionally, all 17 cities only had one possible matched city based on both population and crime rate.

Table 2: Cities Included with Population and Crime Rates in 1985

City	Drug Court	Population	Crime Rate	Matched City	Population	Crime Rate
Denver, CO	7/1/1994	1,609,093	8,061.6	San Antonio, TX	1,216,844	8,217.3
District of Columbia	12/1/1993	3,463,544	5,145.0	Boston, MA	2,842,265	5,505.0
Fort Lauderdale, FL	7/1/1991	1,132,199	7,883.8	Oklahoma City, OK	963,712	8,092.9
Gainesville, FL	3/1/1994	196,553	7,281.5	Fort Pierce, FL	196,967	7,270.3
Honolulu, HI	12/5/1995	817,083	5,146.1	Hartford, CT	740,083	5,294.4
Jacksonville, FL	9/1/1994	823,597	7,422.9	Orlando, FL	853,422	7,023.6
Little Rock, AR	6/1/1994	494,858	6,219.4	Jersey City, NJ	563,409	6,378.5
Madison, WI	8/1/1992	327,177	5,621.4	Fayetteville, NC	254,985	6,532.1
Roanoke, VA	9/1/1995	225,502	5,129.0	Brockton, MA	198,209	5,380.2
St Joseph, MI	10/1/1992	86,764	5,201.5	Kenosha, WI	121,619	6,067.3
San Francisco, CA	11/1/1995	1,586,582	6,045.8	Milwaukee, WI	1,396,415	5,095.6
Stockton, CA	7/3/1995	410,151	8,398.4	Flint, MI	434,642	8,220.1
Tacoma, WA	10/1/1994	523,234	7,508.1	Shreveport, LA	362,264	7,364.5
Modesto, CA	6/1/1995	304,269	7,096.7	Anchorage, AK	229,579	6,369.0
San Jose, CA	9/1/1995	1,411,244	5,282.6	Columbus, OH	1,278,024	5,393.9
Tallahassee, FL	1/1/1994	214,987	7,130.2	Waco, TX	186,443	6,921.2
Bakersfield, CA	7/1/1993	475,800	6,906.1	Corpus Christi, TX	371,076	6,674.4

The use of official data as a measure of crime at the aggregate level has been widely debated in the field of criminology (Warner and Coomer, 2003). Official crime data are a reflection of police activity, and may not in fact capture actual offending rates (Roberts and LaFree, 2004; DeFleur, 1975). Some of the problems of official statistics include: "variation in citizen reporting and police recording practices, possible race and social class biases in the structure of policing, limited coverage of crime types under UCR data, conceptual and methodological factors that affect the classification of crime incidents and estimates of national crime rates and political manipulation and fabrication of these data by police departments and other reporting agencies" (Mosher et al., 2002:84).

Even with the shortcomings associated with the use of official data to examine offender behavior, the use of official statistics has been found to be a "meaningful measure of the relative level of visible drug activity…" (Warner and Coomer, 2003). Official crime rates for drug-related offenses are also generally the only data available since most police activities dealing with these types of crimes tend to be proactive (Warner and Coomer, 2003). Rosenfeld and Decker (1999) have concluded that even with the known deficiencies of the UCR, its measures are fairly valid for the purposes of intercity comparisons of crime rates. One advantage of using the UCR Index of Crime data is that it is a measure of crimes known to police. As noted by Roberts and LaFree (2004), the use of crimes known to police is a better measure of crime rates than arrest rates. Even while arrest rates have been found to be an acceptable indicator of crime rates, using crimes known to police is an improvement on those measures.

Given the dependent variable and the exogenous variables available, the current research will attempt to answer the following question: Net of a set of control variables, does drug-related offending significantly decrease following the implementation of a drug court in a city. Based on this research question, the working hypothesis is that cities with drug courts will have significantly lower rates of crime for drug-related offenses than similarly sized cities with comparable crime rates without drug courts.

This hypothesis is based on the argument for why drug courts should cause a negative effect on the drug offense crime rate in a city. The design of drug courts was partly to interrupt the cycle of reoffending that the traditional justice system often

created by establishing a direct link between the judge and the offender. Because drug courts are an effort to interrupt the cycle of drug use and crime, an effective drug court in a community should reduce the rates of offending in that community. These offenders should be removed from the cycle of re-offending, thereby reducing the population of drug offenders. As noted by Gottfredson et al. (2003:172), "the basic premise underlying drug treatment courts is that addiction to expensive drugs leads to criminal involvement because the need for drugs causes addicts to engage in income-producing crime to support the drug habit". The implementation of a drug court in a city should, therefore, reduce the drug-related crime rates of that city.

Drug courts may result in having a positive effect on drug-related crime rates if cities with drug courts also have a police force that is particularly focused on drug crimes. If the presence of a drug court is an indicator of the overall sentiment of the city in their awareness of the drug problem, it may be possible to find a higher arrest rate among cities with drug courts. It is also possible that other characteristics of a city are responsible for other differences in the drug offense rate. Pre-existing trends in the rate of drug offending could also artificially produce significant results. I will attempt to control for these alternative explanations by including control cities without drug courts that are matched on key characteristics to those cities with drug courts. I also plan on including a time span of 15 years to evaluate any preexisting trends.

Methods

The data are organized in a panel framework that includes a sample of cities over a period of time. The use of a panel data set provides a number of advantages over a general cross-sectional analysis. Pindyck and Rubinfeld (1998) identify some of these advantages as an increase in the degrees of freedom resulting from the greater number of data points, and the ability to incorporate both cross-sectional and time-series variables in order to reduce the problems related to an omitted-variables bias. Kennedy (2003) argues that the use of panel data can alleviate some of the omitted variable bias that can occur at the city level as well as bias due to omitted time series variables. Panel data also has the advantage of dealing with multicollinearity problems because it creates variation between cities and time. Additionally, according to Kennedy, the use of panel data provides advancement over cross-sectional data in its ability to provide better estimates of dynamic changes.

A fixed-effects (within city) model will be used in the analysis of the UCR data. Using the fixed-effects model takes into account the fact that some data sets violate the assumption of a constant slope and intercept, and adds dummy variables to allow variation in the intercept over time and cross-sectional units (Pindyck and Rubinfeld, 1998). The addition of the dummy variables is a solution to the problem of bias caused by omitting variables that are correlated with the variables included in the model (Kennedy, 2003). The dummy variables correct for the fact that while all cities are influenced by the overall crime trend occurring in the country, the individual crime rates for each city start at different levels and, therefore, have different intercepts. The dummy variable also reduces heteroscedasticity by

assigning the part of the error variance related to each time period to that time period and creating more constant variance across observations (Roberts and LaFree, 2004). Using a fixed-effects model allows for the examination of any *within* city variation due to the implementation of a drug court.

Before results for the entire collection of cities is obtained using a fixed-effects panel model, interrupted time series models will be run to assess the impact that the implementation of drug courts has on the individual crime rates of each of the drug court cities. This analysis will be conducted in order to determine if there are some cities that have more effectively implemented drug courts than others. McDowall et al. (1980) state that using a time series quasi-experimental analysis allows for estimation of an impact of a specific intervention, along with the direction of that impact, on a social process. This will be a useful tool in determining if drug courts have had an impact on crime rates in individual cities.

Statistical analysis of longitudinal data has the problem of spurious results if traditional tests of significance are used, such as ordinary least squares. Differences in the dependent variable, which are not a result of the independent variable, may be interpreted as statistically significant if care is not taken to account for any natural changes occurring in the dependent variable. Autoregressive Integrated Moving Average (ARIMA) models will be used to determine the statistical significance of the implementation date of the drug court on crime rates in each city. Using ARIMA an autoregressive coefficient and a moving average coefficient are calculated. The test can determine if there was a significant change in the dependent variable (crime rates) after the introduction of the independent variable (drug court). Specifically, "[t]he

method consists of determining whether the pattern of postresponse measures differs from the pattern of preresponse measures" (Kerlinger and Lee, 2000:545). ARIMA can identify effects that are: "…(a) abrupt, permanent effects, (b) abrupt, temporary effects, or (c) gradual, permanent effects" (Braden and Gonzalez, 1990:225). These coefficients and their relative p-values will be used to assess the significance of the tests. Once these tests of significance are conducted, the drug court implementation date for each city will be imposed on each city's matched control and ARIMA analyses will be run to determine if the same relationships occur in these cities to rule out the existence of spurious results.

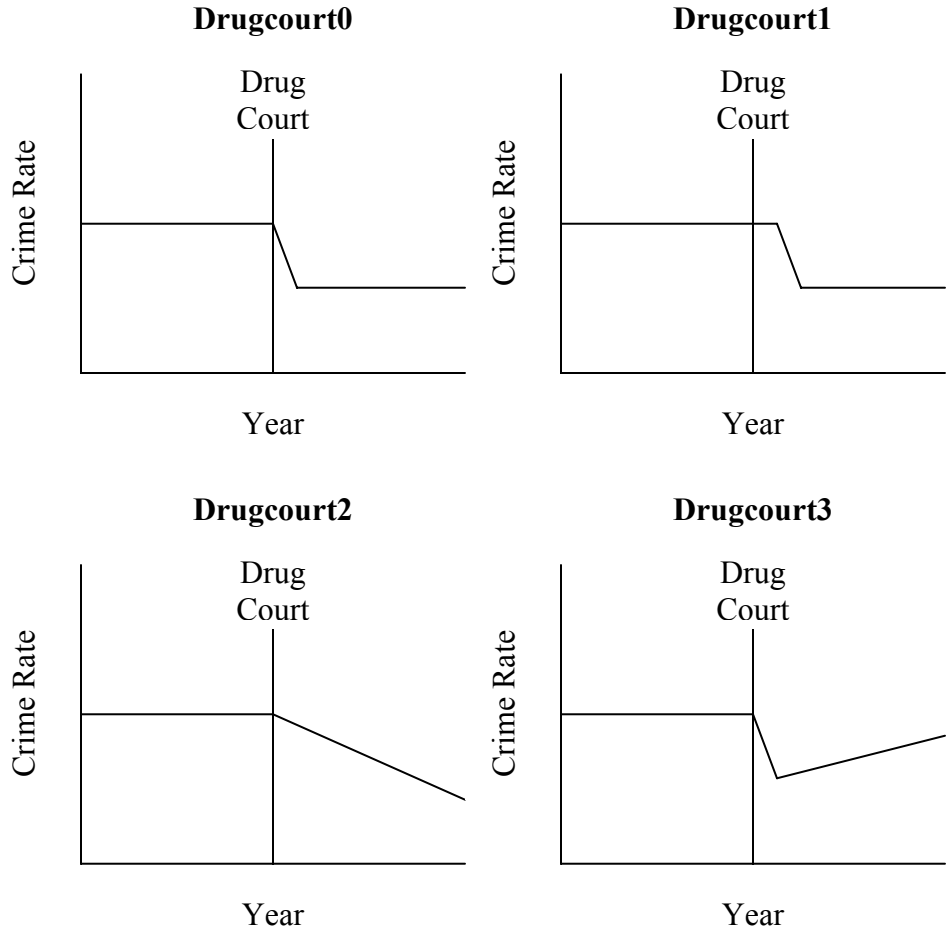
Data Analysis

In order to determine the best functional form of the influence of the implementation of the drug court on city-level crime rates, I tested several models to determine the best fit for the possible implementation effect in the fixed-effect panel framework. In order to determine how the drug court implementation effect should be modeled, I considered several theoretical possibilities. In a fixed-effect panel model, dummy variables are created to take the place of the explanatory variable and to measure the change in the intercepts of both the cross-sectional and time-series components of the model (Pindyck and Rubinfeld, 1998).

For the purposes of this study, to account for the presence of a drug court, a dummy variable is added where a 1 represents the presence of a drug court in city *i* at year *t*. Using this form of drug court implementation would imply that drug courts would have an immediate and constant effect on crime rates. It is a theoretical

question to be considered if an immediate, constant effect is plausible. In order to test the best fit for the functional form of drug court implementation effect, I created several drug court variables to model possible theoretical effects. The possible effects tested were an immediate, constant effect (Drugcourt0); a one-year lagged, constant effect (Drugcourt1); a gradual increase in effect from the date of implementation through the first four years (Drugcourt2); and an immediate effect for a year from the date of implementation followed by a decline in effectiveness (Drugcourt3). Figure 1 illustrates the basic functional form of each of the possible drug court implementation effects tested.

Figure 1: Drug Court Implementation Functional Forms Tested



The Drugcourt0 model operationalizes the drug court implementation effect to take a full and immediate effect that remains constant for all years that the drug court is in operation. Using this model would require drug courts to have the same influence on crime rates starting as soon as they began operating, which may not be practically possible. It also seems unlikely that a drug court would be able to have an immediate effect on crime rates before participants in the drug court program have a chance to be influenced by the drug court programs or graduate and return to their normal social environment.

The second functional form, Drugcourt1, operationalized the drug court implementation effect to be lagged by one-year, but then to be at its maximum effectiveness and constant across the rest of the years. This would allow the drug court time to establish its operation procedures and would allow time for participants to be fully integrated into the drug court program.

The use of the Drugcourt2 variable operationalizes the drug court implementation effect to take the form of an immediate, but initially small and gradually increasing effect. This model for drug court implementation proposes that in the first year after a drug court is implemented, the effect that it can have on the crime rate of the city is minimal. However, with each year that the drug court is in operation, the effect that it has on crime rates increases until it reaches its maximum effectiveness. It is possible that drug courts, after being officially implemented, take a few years to reach their full potential. The operation of a drug court is not an easy task, and it is therefore reasonable to assume that it may take a few years to start running as efficiently as possible. Using the gradual effect model allows for the drug

court to settle into its daily procedures and start treatment of clients before the drug court is expected to be operating at its maximum effectiveness and influencing crime rates.

This functional form fits into the social learning theoretical framework. By allowing for a lagged, gradual effect, drug court participants have the time to be exposed to the new system of reward and punishment. Additionally, the gradual increase in effectiveness allows for participants to graduate and then pass on their new values to others who have not experienced the drug court program first hand.

The final functional form tested, Drugcourt3, operationalizes the drug court implementation effect to be immediate for a year after implementation and then follows a steady decline over the next few years until it levels out at a lower effectiveness rate. The initial higher impact possibly produced by an immediate deterrence effect of the drug court. The decline after may be due to the initial influence wearing off as offenders go back to their regular daily routines.

Once these models were created, I ran fixed-effect regressions and compared the proportion of the total variation in crime rates explained by the implementation of a drug court (noted as R^2) for the within city differences to determine the form that best fit the possible implementation effect of drug courts on a city's crime rate[4]. The Drugcourt0 model resulted in a R^2 of 0.17; the Drugcourt1 model had a R^2 of 0.21; Drugcourt2 had a R^2 of 0.28; and Drugcourt3 produced a R^2 of 0.08. Based on the results from these models, the gradual increase in effect (Drugcourt2) is the best fit for the drug court effect. Based on the prominence of social learning theory in drug court operations, it is not surprising that this functional form it the best fit.

[4] The fixed-effect regressions were run using the STATA 8 statistical package.

For the analysis, I included six different crime rates in order to examine the effect drug courts may have on the overall crime rate of a city and then by type of crime. I selected the types of crime included in the analysis based on two empirical findings: the types of crimes for which offenders most often report being under the influence of drugs at the time of their offense, and crimes that are most often committed for the purpose of obtaining money to buy drugs. Based on ADAM data, almost one-quarter (22%) of Federal prison inmates and one-third (33%) of State prison inmates reported being under the influence of drugs while committing the offense for which they were arrested (ONDCP, 2000). The other offenses with the highest percentages for offenders reporting to be under the influence of drugs at the time of the offense are: robbery (40%); burglary (38%); larceny (38%); and motor vehicle theft (39%). Additionally, 27% of inmates reported committing robbery in order to buy drugs, while 30% reportedly committed burglary, and 31% reported committing larceny to buy drugs (ONDCP, 2000). A measure of property crime was also included to measure if property crime as a whole is impacted by the implementation of drug courts.

The only violent crime included in the analysis is robbery, based on the finding that 40% of offenders report being under the influence of drugs at the time of their offense and that 27% reported committing robbery in order to buy drugs. Other violent crimes were not included due to the low percentages of offenders who report being under the influence of drugs at the time of their offense, or committing the offense in order to buy drugs. Drug crimes were also not included in the analyses due to the poor quality and reliability of this data at the city level in the UCR.

A key element that must be controlled when doing analysis of crime trend data is an existing time trend. It is important not to attribute the effect of the intervention to an effect of the time trend. To determine the nature of the time trend, I first created indicator variables for each year to determine the effect that year had in comparison to the initial year in the time series. Based on the coefficients for each year a curvilinear time trend was identified. This time trend can easily be seen in Figure 2.

The use of ARIMA in STATA will automatically control for time trends using the autoregressive and moving averages specification. Before running an ARIMA model the data are designated as time-series data in STATA. This allows the year variable to represent time. Including the time variable with the significant autoregressive and moving average specifications in the model controls for the yearly differencing in the dependent variable. This process reduces the noise in the model created by the existing time trend.

The time trend can also be controlled for in the fixed-effects panel model analysis by using the interaction expansion function in STATA. This function will expand the year variable into multiple dummy variables, which will then be included in the model. These dummy variables compare the independent variable for each year to the reference category, which in this case is the first year of the study. Doing this allows enables the determination of the actual time trend that is present in the data and for it to be controlled for, by including the dummy variables in the model.

Figure 2: Mean Crime Rate over Time for All Cities

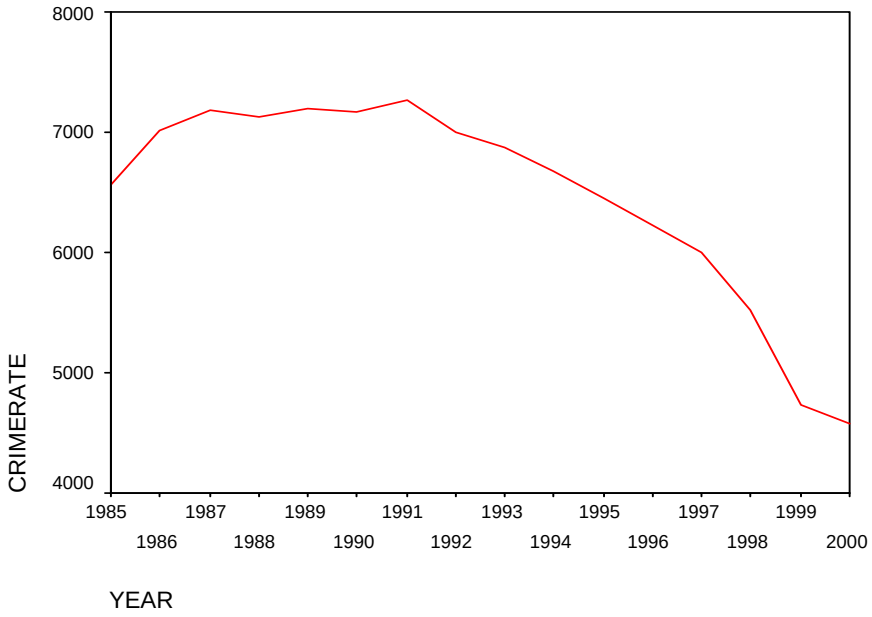
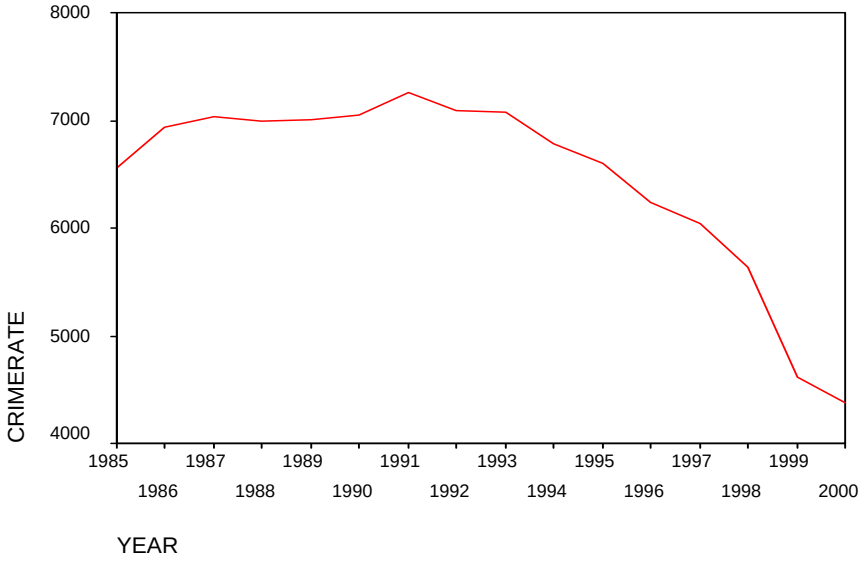


Figure 2 illustrates the mean overall crime rate for all cities included in this analysis and shows that there is a slight increase in the mean crime rate from 1985, which peaks in 1991, and then there is a pronounced decline in the mean crime rate until 2000. According to Mosher et al. (2002), the index crime rate for the United States reportedly decreased by over 20 percent between 1990 and 1999. Due, especially, to this distinct decline in the crime rate right around the time that cities began implementing drug courts in the early 1990s, it is important to not assign the effect of this trend to the effect of the drug court.

Figure 3: **Mean Crime Rate over Time for Drug Court Cities**



Figures 3 and 4 illustrate the mean overall crime rate for the years included in the study for drug court cities and control cities, respectively. These graphs show that the overall crime trend is similar for both drug court cities and control cities included in the analysis. There is a general slow incline in crime rates from 1985 until 1991, which is then followed by a steady decrease from the peak in 1991 until the end of our time series in 2000. It does appear, however that non-drug court cities did experience a sharper decline in crime rates after 1992 but the overall crime rate in year 2000 is slightly higher. While it is hard to determine from these data because the series ends in 2000, it does appear that in 1999 the overall crime rate decrease began to slow down. See Appendix B for time series graphs of the mean total crime rate for all individual drug court cities with reference lines indicating the drug court implementation year

Figure 4: **Mean Crime Rate over Time for Control Cities**

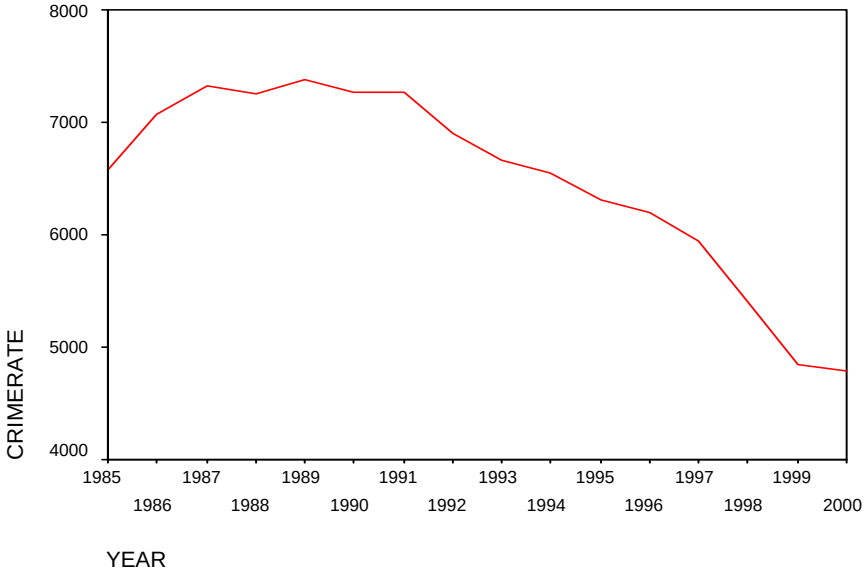
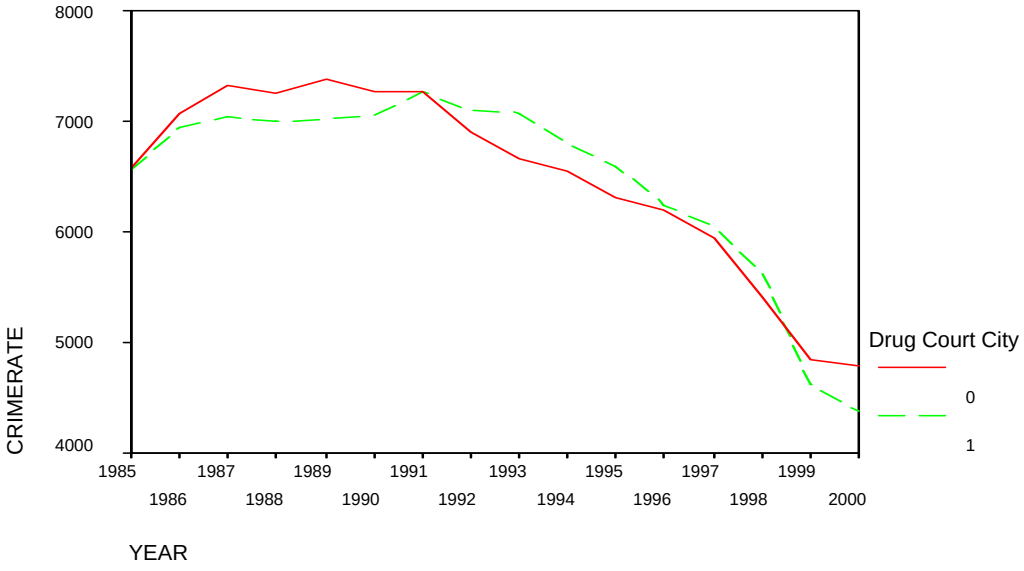


Figure 5 illustrates both the drug court and control cities' mean crime rates. The dotted line indicates the mean crime rate for cities with drug courts. The two crime rates appear to follow similar time trends.

Figure 5: Mean Crime Rates over Time for Drug Court and Control Cities



This chapter described the methodology used in the analysis of drug court implementation on city-level crime rates. The data were drawn from the UCR's

Index of Crime, Metropolitan Areas from the years 1985 to 2000. I chose thirty-four cities total for inclusion in the analysis. The main hypothesis is that cities with drug courts will have significantly lower crime rates for drug-related offenses than similarly sized cities with comparable crime rates without drug courts. Both ARIMA and fixed-effects panel models will be run to examine individual city and collective city results, respectively. The functional form to be used for the drug court implementation is a gradual increase in effect from the date of implementation through the first four years. For the analyses, I will include six different crime rates to examine the effect drug courts may have on overall crime rates and by property, robbery, burglary, larceny, and motor vehicle theft rates.

Chapter 4: Results

This chapter includes a presentation of the results from the various analyses conducted. First, basic descriptive statistics are discussed, followed by the results from the individual ARIMA analysis conducted for both the drug court cities for each of the crime rate types and the overall results for the control cities. Second, the results from the fixed-effects panel model analyses for each crime type will be presented.

Results

The units of analyses used in this study are the 34 cities for fifteen years that I chose based on the criteria previously discussed. Descriptive statistics, including the mean crime rate for all years in the analysis, the standard deviation, and the minimum and the maximum crime rate for each drug court city, by crime rate can be found in Table 3. Descriptive statistics for the other crime types can be found in the Appendix A. Of these 34 cities, the 17 that had a drug court implemented before 1995 were the treatment group. I treated the other 17 cities as a control group. Descriptive statistics for these cities can be found in Table 4. As noted above, I selected control cities by matching the selected drug court cites on crime rate and population in 1985, the first year used in the time series. In order to be selected, the control city crime rate had to be within a 10 percent difference of the crime rate of the drug court city and the control city population had to be within a 25 percent difference of the population of the drug court city.

Table 3: **Descriptives by Drug Court Cities: Crime Rate**

City	Mean	Standard Deviation	Minimum	Maximum
Bakersfield, CA	6072.41	1170.11	3741.60	7593.40
Denver, CO	6061.51	1275.93	3936.90	8194.60
Fort Lauderdale, FL	7659.39	1427.34	4330.20	8904.10
Gainesville, FL	8980.83	1185.14	6225.50	10757.60
Honolulu, HI	6012.18	726.69	4776.00	7627.80
Jacksonville, FL	7913.60	1632.95	3849.80	10313.60
Little Rock, AR	7590.56	1105.46	5773.60	9352.20
Madison, WI	4491.52	855.89	2991.80	5621.40
Modesto, CA	6699.03	890.29	4583.70	7647.60
Roanoke, VA	4361.88	839.24	2772.30	5536.50
San Jose, CA	4294.42	899.78	2264.30	5282.60
Saint Joseph, MO	5368.96	448.12	4334.70	6180.90
San Francisco, CA	5806.94	1078.22	3635.70	7045.90
Stockton, CA	7377.94	1365.80	4577.90	8632.90
Tacoma, WA	7201.56	658.20	5912.20	8252.20
Tallahassee, FL	8740.22	1566.49	6040.50	11353.30
Washington, DC	5159.81	692.68	3329.40	5898.60
Average	6458.40	1048.14	4298.59	7893.84

Table 3 shows that the mean crime rate for the drug court cities ranges from 4294.42 in San Jose, CA to 8980.83 in Gainesville, FL. The overall average crime rate for the drug court cities is 6458.40. Table 4 shows that the mean crime rate for the non-drug court cities ranges from 4460.01 in Kenosha, WI to 8395.80 in San Antonio, TX. The overall average crime rate for non-drug court cities is 6484.98. The similarity of these mean crime rates illustrates the extent to which the drug court and control cities were matched.

Table 4: **Descriptives by Non-Drug Court Cities: Crime Rate**

City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	6128.50	823.30	4479.90	7356.90
Boston, MA	4606.91	956.61	2687.30	5613.20
Brockton, MA	4627.45	1039.52	2663.70	5816.00
Columbus, OH	6279.97	414.26	5393.90	6984.40
Corpus Christi, TX	7912.01	1214.79	5534.40	9687.20
Fayetteville, NC	7525.25	1134.90	5692.30	9047.40
Flint, MI	7319.38	950.90	5051.60	8561.80
Fort Pierce, FL	6179.32	1349.31	3676.50	8283.90
Hartford, CT	4878.97	833.91	3494.60	5964.90
Jersey City, NJ	6267.77	1224.62	3805.40	7643.70
Kenosha, WI	4460.01	1031.64	2815.90	6067.30
Milwaukee, WI	5293.56	491.42	4320.10	6066.10
Oklahoma City, OK	7782.52	916.15	5807.90	9258.80
Orlando, FL	7386.33	873.33	5314.00	8645.90
San Antonio, TX	8395.80	1909.23	5589.70	10873.90
Shreveport, LA	7723.74	865.24	5821.60	9166.20
Waco, TX	7477.14	1085.92	5617.60	9361.40
Average	6484.98	1006.77	4574.49	7905.82

Individual Drug Court City ARIMA Analyses

The most telling analysis of a drug court implementation influence on crime rates was the individual time-series analysis of each city with a drug court, examining the impact of the drug court on overall crime rates. Although drug courts may have, in outward appearance, similar characteristics in their structure and operation, there are likely attributes of drug courts that are variable across drug courts and may play an import role in the drug court's ability to impact crime rates. Results for the individual time-series analyses using ARIMA are presented in Table 5.

These results show the impact on crime rates that the implementation of a drug court had on individual cities. I estimated the effects for individual cities using a quasi-experimental interrupted time-series design and analyzed using ARIMA. The results from these analyses indicate that some structures of drug courts may be more effective in reducing drug-related crime than others. According to the results in Table 5, eight cities had a statistically significant difference in their crime rates after drug courts implementation.

Table 5: Effect of Drug Courts on Total Crime Rates by City

City	β	S.E.
Denver, CO	-69.27	223.41
District of Columbia	-516.55 *	169.60
Fort Lauderdale, FL	-725.86	507.37
Gainesville, FL	-1215.17 *	465.71
Honolulu, HI	-658.43 *	329.66
Jacksonville, FL	-1032.69 *	591.45
Little Rock, AK	-742.96 *	412.15
Madison, WI	-92.80	144.99
Roanoke, VA	-124.00	219.92
St Joseph, MI	-257.73	420.66
San Francisco, CA	-424.73	316.49
Stockton, CA	-482.60	342.65
Tacoma, WA	-45.36	320.88
Modesto, CA	-745.23 *	309.89
San Jose, CA	-443.41 *	145.37
Tallahassee, FL	-953.10 *	504.55
Bakersfield, CA	-344.71	240.79

* $p < .05$

As shown in Table 5, drugs courts do appear to be associated with overall crime rates in some individual drug court cities. The District of Columbia, Gainesville, FL, Honolulu, HI, Jacksonville, FL, Little Rock, AK, Modesto, CA, San Jose, CA, and Tallahassee, FL all had statistically significant effects. All of the effects for drug courts on the crime rates are also in the hypothesized direction.

Therefore, the implementation of a drug court is associated with a reduction in that city's overall crime rate.

After evaluating the overall crime rates for each drug court city I conducted subsequent ARIMA analyses of the effect of drug court implementation on the various drug-related crime types. Table 6 contains the individual city ARIMA analyses for each city with a drug court for property crimes. In these analyses I found five cities, the District of Columbia, Gainesville, FL, Fort Lauderdale, FL, Honolulu, HI, and Bakersfield, CA, to have statistically significant differences in crime rates after a drug court was implemented. All cities, except Denver, CO and Tacoma, WA had coefficients in the expected direction, and both cities with positive coefficients were statistically insignificant.

Table 6: Effect of Drug Courts on Property Crime Rates by City

City	β	S.E.
Denver, CO	34.61	230.75
District of Columbia	-384.60 *	179.32
Fort Lauderdale, FL	-567.38 *	311.26
Gainesville, FL	-852.45 *	389.21
Honolulu, HI	-578.25 *	311.09
Jacksonville, FL	-714.13	572.88
Little Rock, AK	-473.42	308.55
Madison, WI	-97.51	107.16
Roanoke, VA	-86.16	218.00
St Joseph, MI	-181.94	472.88
San Francisco, CA	-283.73	256.85
Stockton, CA	-237.02	417.11
Tacoma, WA	104.64	346.89
Modesto, CA	-432.84	324.28
San Jose, CA	-229.37	179.45
Tallahassee, FL	-628.48	690.18
Bakersfield, CA	-270.95 *	164.65

* $p < .05$

The results from the ARIMA analyses for robbery rates by drug court city are included in Table 7. The District of Columbia, Gainesville, FL, and Madison, WI had

statistically significant differences in robbery rates after the implementation of a drug court. These results are all in the expected direction, however for Madison, WI with a coefficient of just 6.49, it does not appear to be a very large effect compared to the effects for the District of Columbia, with a coefficient of 32.48 and Gainesville, FL, with a coefficient of 30.38.

Table 7: Effect of Drug Courts on Robbery Rates by City

City	β	S.E.
Denver, CO	-5.34	23.32
District of Columbia	-32.48 *	17.40
Fort Lauderdale, FL	-23.13	17.14
Gainesville, FL	-30.38 *	17.36
Honolulu, HI	-15.04	10.42
Jacksonville, FL	-60.75	81.35
Little Rock, AK	-43.96	56.40
Madison, WI	-6.49 *	2.45
Roanoke, VA	-15.84	14.27
St Joseph, MI	-3.52	9.25
San Francisco, CA	-44.75	65.88
Stockton, CA	-22.23	24.99
Tacoma, WA	-18.12	25.86
Modesto, CA	-22.35	49.84
San Jose, CA	-11.37	10.69
Tallahassee, FL	-46.96	59.58
Bakersfield, CA	-9.96	14.11

* $p < .05$

Table 8 includes the results from the ARIMA analysis for burglary rates by drug court city. There is only one statistically significant difference between pre-drug court crime rates and post-drug court crime rates for burglary rates among our included cities. Only Fort Lauderdale, FL found statistically significant results. Burglary rates also have relatively more cities with coefficients that are positive than for other crimes, however since none of the effects are statistically significant, little can be said about these findings.

Table 8: Effect of Drug Courts on Burglary Rates by City

City	β	S.E.
Denver, CO	63.36	109.60
District of Columbia	-42.96	43.67
Fort Lauderdale, FL	-103.98 *	56.40
Gainesville, FL	-163.65	296.63
Honolulu, HI	-74.69	69.62
Jacksonville, FL	-113.88	642.43
Little Rock, AK	-113.49	172.40
Madison, WI	16.22	43.14
Roanoke, VA	18.07	216.16
St Joseph, MI	32.19	82.47
San Francisco, CA	-5.52	67.09
Stockton, CA	3.33	134.77
Tacoma, WA	168.48	181.86
Modesto, CA	-125.36	119.73
San Jose, CA	-6.62	51.78
Tallahassee, FL	-29.30	221.59
Bakersfield, CA	-55.80	107.39

* $p < .05$

Table 9 displays the results of the individual city analyses for larceny rates. Among the different types of offenses included in the analyses, larceny rates had the most cities with statistically significant findings. Five cities total experienced a statistically significant decrease in their larceny rates after the implementation of a drug court. These cities are the District of Columbia, Gainesville, FL, Honolulu, HI, Modesto, CA, and Tallahassee, FL. This list of cities is fairly similar to that of the cities with a statistically significant difference in overall crime rates with the addition of Honolulu, HI and the substitution of Tallahassee, FL for San Jose, CA. Larceny rates comprise a large proportion of the overall crime rate in a city, and therefore it may be that the changes in the larceny rate are driving the results found in the aggregate crime rate.

Table 9: Effect of Drug Courts on Larceny Rates by City

City	β	S.E.
Denver, CO	-43.97	104.81
District of Columbia	-280.29 *	111.68
Fort Lauderdale, FL	-358.11	908.12
Gainesville, FL	-611.45 *	194.42
Honolulu, HI	-423.08 *	208.39
Jacksonville, FL	-443.04	298.82
Little Rock, AK	308.19	171.57
Madison, WI	-37.29	121.06
Roanoke, VA	-106.80	168.09
St Joseph, MI	-210.86	473.75
San Francisco, CA	-203.09	577.77
Stockton, CA	-70.78	220.03
Tacoma, WA	-110.84	208.39
Modesto, CA	-202.64 *	78.12
San Jose, CA	-176.98	157.42
Tallahassee, FL	-507.39 *	237.36
Bakersfield, CA	-139.84	94.24

* $p < .05$

The results for individual ARIMA analyses for motor vehicle theft by drug court city can be found in Table 10. Only Modesto, CA has a statistically significant difference for pre- versus post-drug court rates. While only one city is statistically significant, the majority of the coefficients are in a negative direction, with fourteen cities having negative coefficients compared to three with positive results.

Table 10: Effect of Drug Courts on Motor Vehicle Theft Rates by City

City	β	S.E.
Denver, CO	15.23	68.88
District of Columbia	-61.35	44.66
Fort Lauderdale, FL	-97.58	76.84
Gainesville, FL	-77.30	53.37
Honolulu, HI	-72.49	84.14
Jacksonville, FL	-157.22	223.19
Little Rock, AK	-57.74	57.42
Madison, WI	-18.59	29.40
Roanoke, VA	2.54	17.28
St Joseph, MI	1.86	9.09
San Francisco, CA	-73.41	103.71
Stockton, CA	-169.56	111.08
Tacoma, WA	-29.26	51.46

Modesto, CA	-160.83 *	59.56
San Jose, CA	-45.79	34.84
Tallahassee, FL	-91.80	142.68
Bakersfield, CA	-75.26	51.54

* p < .05

An examination of all of the findings reveals an interesting pattern among the coefficients that is worth noting. The direction and the significance of the coefficients for the individual drug court cities by crime rate type can be found in Table 11. Most of the coefficients, while not all significant, are in the hypothesized, negative direction. Of the findings, ninety-two percent were negative, with over a fifth of those reaching statistical significance. Four cities, the District of Colombia, Gainesville, FL, Honolulu, HI, and Modesto, CA reached statistical significance for three or more crime types, with the District of Columbia and Gainesville, FL resulting in the most statistically significant findings. Also worth noting is that none of eight positive findings reached statistical significance.

Table 11: Direction and Significance of Effect of Drug Courts by Type of Crime and City

City	Property Crime	Robbery	Burglary	Larceny	MVT	Crime Rate	Total Negative	Total Significant
Denver, CO	+	-	+	-	+	-	3	0
District of Columbia	-*	-*	-	-*	-	-*	6	4
Fort Lauderdale, FL	-*	-	-*	-	-	-	6	2
Gainesville, FL	-*	-*	-	-*	-	-*	6	4
Honolulu, HI	-*	-	-	-*	-	-*	6	3
Jacksonville, FL	-	-	-	-	-	-*	6	1
Little Rock, AK	-	-	-	-*	-	-*	6	2
Madison, WI	-	-*	+	-	-	-	5	1
Roanoke, VA	-	-	+	-	-	-	5	0
St Joseph, MI	-	-	+	-	-	-	5	0
San Francisco, CA	-	-	-	-	-	-	6	0
Stockton, CA	-	-	+	-	-	-	5	0
Tacoma, WA	-	-	+	-	-	-	5	0
Modesto, CA	-	-	-	-*	-*	-*	6	3
San Jose, CA	-	-	-	-	-	-*	6	1
Tallahassee, FL	-	-	-	-*	-	-*	6	2
Bakersfield, CA	-*	-	-	-	-	-	6	1
Total Negative	16	17	11	17	16	17	92.2%	
Total Significant	4	3	1	6	1	8		22.5%

* p < .05

In order to assess whether the results found with the drug court cities are the result of a spurious relationship due to the large decrease in crime rates during the time period of interest, I imposed the drug court implementation dates on the control cities. If similar patterns are found in the direction and significance of the coefficients, then it is likely that the results are due to a spurious relationship. Only the overall direction and significance of results are presented here due to the style of matching used. While I matched control cities to individual drug court cites, their purpose was to provide a group of cities that is similar to the drug court cities selected for group comparisons, not to provide exact city to city comparisons.

Table 12: Direction and Significance of Non-Drug Court Cities by Type of Crime

City	Property Crime	Robbery	Burglary	Larceny	MVT	Crime Rate	Total Negative	Total Significant
San Antonio, TX	-	-	+	-	-	-	5	0
Boston, MA	-	-	-	-	+	-	5	0
Oklahoma City, OK	-	-	+	-	-	-	5	0
Fort Pierce, FL	-	-	-	-	-	-	6	0
Hartford, CT	-	+	-	-	-	-	5	0
Orlando, FL	-	-	-	-	-	-*	6	1
Jersey City, NJ	-	-*	-	-	-	-	6	1
Fayetteville, NC	-	-*	-	-*	-	-*	6	3
Brockton, MA	-	-	-	-	+	-	5	0
Kenosha, WI	-	-	+	-	-	-	5	0
Milwaukee, WI	-	-	-	-	-	-	6	0
Flint, MI	-	-	-	-	-	-	6	0
Shreveport, LA	-	-	-	-	-	-	6	0
Anchorage, AK	-	-	-	-	-	-	6	0
Columbus, OH	-	-	+	-	-	-	5	0
Waco, TX	-	-	-	-	-	-	6	0
Corpus Christi, TX	-	-	+	-*	-	-*	5	2
Total Negative	17	16	12	17	15	17	92.2%	
Total Significant	0	2	0	2	0	3		9.8%

* $p < .05$

Table 12 illustrates the direction and significance of the coefficients for the individual control cities by crime rate type. As with the results for drug court cities, ninety-two percent of the coefficients for non-drug court cities were in the negative direction. These results suggest that it is possible that the time trend that exists in the

crime rate is very powerful and is probably driving much of the negative relationship that is found between the drug court and the crime rates. There is, however, a noticeable difference between the total number of significant findings for drug court cities and control cities. As shown in Table 11, 22.5% of the negative results for the drug court cities are statistically significant, whereas Table 12 indicates that only 9.8% of the control cities had statistically significant results. Results from the drug court cities reached statistical significance for more than twice as many crime rates than for the control cities.

Fixed-Effects Panel Model Analyses for All Cities

Once I conducted the individual ARIMA analyses, fixed-effects panel analyses were conducted to determine if the relationship found for the individual drug court cities could be applied to drug court cities collectively compared to non-drug court cities. Table 13 shows the results from the fixed-effects panel model analyses that included all thirty-four cities for the overall crime rate, and then by the types of crime rates chosen for analysis, controlling for the overall crime trend. After controlling for the time trend that was evident in the data, a statistically significant effect was not found while comparing cities with drug courts against those without. The effect that was found is a relatively small, positive effect ($\beta = 24.59$). The reported proportion of the total variation in crime rates explained by the implementation of a drug court (R^2) for each crime rate represents the within city variation that is explained by the model. With a R^2 of 0.64, sixty-four percent of the within city variation was found to be explained by the model, including the presence or absence of a drug court and the time trend. This is an increase of 0.36 from the

model that did not include the time trend, suggesting that time is a very large determining factor of crime rates at the city-level.

The property crime rate results closely resemble the findings for the overall crime rate since the overall crime rate is mostly comprised of property crime, about 88% of the "known offenses in the UCR crime index (Mosher et al., 2002:79). The results show that like the overall crime rate, property crime had a non-significant effect and opposite the hypothesized direction ($\beta = 67.55$, $R^2 = 0.58$). Any variation between the two findings is possibly due to the smaller percentage of violent crimes.

Of the different types of individual crimes, robbery has a significant[5] effect with a $\beta = -15.62$. This finding would suggest that cities with drug courts would experience a reduction of 15.62 in the rate of robberies more than cities without drug courts for each year the drug court is in operation. Besides the effects for robbery, larceny has the only outcome that is in the expected direction ($\beta = -84.72$, $R^2 = 0.44$). The findings also show that burglary was not significantly affected by the implementation of drug courts. The coefficient is again small and in the opposite than hypothesized direction ($\beta = 18.74$, $R^2 = 0.67$). Motor vehicle theft also resulted in a positive coefficient ($\beta = 139.93$, $R^2 = 0.27$). The R^2 for motor vehicle theft is relatively small compared to the other individual crime types. This indicates that the model does not capture as much of the proportion of the total variation in motor vehicle theft rates explained by the implementation of a drug court as for the other individual crime rates.

[5] Significance being measured at the $\alpha = .05$ level; one-tailed test.

Table 13: Effects of Drug Courts on Various Crime Rates by Crime Type

	β	S.E.	R^2
Crime Rate	24.59	131.73	0.64
Property Crime Rate	67.55	118.93	0.58
Robbery Rate	-15.62 *	8.94	0.37
Burglary Rate	18.74	45.17	0.67
Larceny Rate	-84.72	78.10	0.44
Motor Vehicle Theft Rate	139.93	29.78	0.26

* $p < .05$

These results indicate that as a group, cities with drug courts do not experience a decrease in crime rates greater than cities without drug courts after the drug courts are implemented. However, these findings are not necessarily evidence to support the claim that drug courts are ineffective. The fact that cities as a group did not experience a greater decrease in crime rates after drug court implementation than cities without drug courts does not allow for conclusions to be drawn about the effectiveness of individual drug courts.

Chapter 5: Discussion and Conclusion

The results from the previous chapter indicate that there are some main conclusions that can be drawn from the analyses. Findings from the fixed-effects panel model failed to indicate that there is an aggregate impact of drug court implementation across all cities. Some evidence for an individual drug court effect was found based on the individual ARIMA analyses. While there may be some individual drug court effects, only 22% of the results reached statistical significance. On the other hand, only around 10% of results for control cities reached statistical significance. Further discussion of these results and implications for policy and future research will be covered in the following sections.

Discussion

The results from the above analyses indicate that there may be some inherent characteristics of drug court structures that influence their ability to effectively reduce crime in a city. While the drug courts in this analysis may have appeared to be similar in many characteristics, there may be other characteristics that are important for which I did not have measures included in the model. Besides the actual structure and operation of the drug court, one additional aspect that may play an important role in their success is the characteristics of the participants.

If it is the case that the structure of drug courts is significant in their ability to reduce crime rates, then it could be argued that the specific deterrent effect experienced by the participants is more important than general deterrence. It appears that there are certain structural aspects of a drug court that are more influential in

their ability to impact crime rates, than just the presence or absence of a drug court, and that the presence of a drug court in any form is not enough to reduce crime rates.

The success of a drug court program is likely related to how well the drug court is incorporated into the city it is designed to serve. Drug court implementation and operation are highly intricate undertakings that must be adapted to function in highly variable and complex environments. Drug courts are expected to fill the needs of different cities with different political climates and policy goals. The interaction between multiple factors involved in the implementation and operation of drug courts in a city will influence the drug court's ability to affect crime rates in that city (Roman et al., 2003).

The resources of a city and any political structures and existing policy initiatives will strongly influence the structure of a drug court and any expected outcomes based on the specific interests of the city. The ability of multiple players in the community, who are responsible for various aspects of a drug court client's participation in a drug court, to effectively communicate and work together is crucial for the success of the drug court program. The policies of these various actors within the criminal justice system in a city are also an important aspect of a drug court's ability to be effective. Roman et al. (2003:12) identifies some of these influences as "policing strategies, prosecutor practices, and parole and probation polices…."

Variation in the characteristics of a city's main criminal justice actors and policies will influence the operations and structure of the drug court. Such structural components are size, target population, intensity of supervision, graduation requirements, eligibility requirements, principle offense charge, case screening, and

judicial assignment among others. These factors then impact who is able to participate in the drug court program. The types of offenders who are processed in a drug court can have a large impact on the overall "success", typically measured in recidivism rates, of a drug court. Therefore, cities may likely target offenders based on the success rate that type of offender is predicted to have.

Some drug courts will be designed and implemented to serve a population of offenders with more severe drug problems or more serious criminal histories, and others will target populations of more marginal drug users and offenders. It would be unreasonable to assume that a program targeting a more difficult population would have the same magnitude of outcomes as a program serving an easier population. A smaller reduction in recidivism for a program that is serving the more difficult population may actually be as important as a greater reduction for offenders who were less likely to be a problem for society (Roman et al., 2003). Drug courts may be targeting more marginal drug users and offenders, who may have the best chances of treatment success. However, these may not be the types of offenders who could benefit the most from participation in a drug court program. The heavier drug users and repeat offenders are more likely to commit crimes that are a larger threat to society, while the more marginal offenders commit less serious crimes, such as possession. It is therefore possible for drug courts to be variable in their expected outcomes based on explanations that are unrelated to the quality of the drug court program and its successful implementation (Roman et al., 2003).

Success of a drug court can be interpreted as highly subjective, based on the characteristics of the city in which the drug court is implemented and the participants

that the drug court hopes to reach. One explanation for the variation in statistically significant findings could be that some cities may be serving a more "high-risk" population or a population that is more difficult to reach. Cities that target offenders who are considered to be "low-risk", or are categorized with primary drug use of marijuana or alcohol, may see the greatest reduction in recidivism but they are not the offenders that pose the greatest threat to society. This distinction between target populations could also play a role in the types of crimes that reach statistical significance for that city. Cities targeting less serious offenders may see a reduction in more types of property crimes, but experience less of a decline for violent crimes.

The results from this study, however, do not show an indication that effectiveness of some drug courts varies based on crime type. Larceny and overall crime rates experienced the most statistically significant negative findings across cities with six and eight, respectively. Interestingly, although the overall crime rate is mostly comprised of property crime, the findings for the property crime rate did not have as many statistically significant findings as for total crime rate. For all the cities included in the analyses, burglary and motor vehicle theft rates each resulted in only one statistically significant finding. Additionally, burglary had the most number of positive coefficients. It is unclear from the available data the implication of these results on how drug courts impact crime rates. Further research is needed to examine how drug courts impact the rates of various crime types differently. As discussed above, the findings from this analysis cannot be applied to individual drug courts or individual participants of drug courts due to the ecological fallacy. The ecological fallacy is when assumptions are made about the correlates of individual behavior

based on the use of aggregated correlates of aggregated crime rates (Flewelling and Williams, 1999).

It is worth noting that of the crime rates included in the fixed-effects panel model analysis, the only rate to result in statistically significant findings is robbery, which is the only violent crime included in the analyses. These results may be related to Goldstein's (1985) first conceptual category to describe the drug-crime relationship; the psychopharmacological effect. As mentioned above his work was predominately focused on exploring the link between drugs and violent crime. While a psychopharmacological effect is often associated with the use of alcohol, the fact that the only statistically significant effect for the fixed-effects panel model analysis was for a violent crime is a result that deserves greater future attention. Drug courts are typically focused on non-violent offenders, but in light of these results, future examination of the impact of drug courts on violent crime is necessary.

I compared my results to the GAO (1997) report on drug courts that included an evaluation of the retention and completion rates of all the drug courts in operation at the time of the time of the report. The GAO reported the completion and retention rates for the drug courts included in their evaluation. While the GAO report contains some missing data it does not appear that the percent completion or percent retention is correlated with my findings regarding the statistically significant decreases in the city's crime rates. From this preliminary comparison, it does not appear that the typical standards for evaluating the operation of the drug courts are influential in city-level crime rates. Further evaluation and comparison of completion and retention rates to the results found in this study is warranted.

Some theoretical processes may be at work in a drug court's ability to influence crime rates. A general deterrent process is built into the structure of drug courts, as they are intended to quickly identify those in need of treatment services, and subsequently react swiftly and with certainty to any violation of the terms of their participation in the program (Gottfredson et al., 2003a). Additionally, social learning theory also provides for the possibility that once drug court participants have learned the values and norms of law-abiding behavior, they can then become examples from which others learn. Therefore, the implementation of a drug court in a city may have a greater impact on that city's overall crime rate than just the reduction of a single individual's future criminal activities.

There are currently hundreds of adult drug courts operating in the United States today with many more in the planning phase. Millions of dollars have been budgeted and spent on drug court programs and they are currently a very popular policy alternative for lawmakers. However, despite this widespread popularity, little sound empirical evidence is available on the effectiveness of the drug court model. It is only recently that a consensus has begun to emerge among researchers that drug courts are effective in reducing drug use and recidivism (Wilson, 2005). In this study I failed to find any collective significant findings of the impact of drug court implementation on crime rates. For the individual city analyses only just over 20% of the findings reached statistical significance. In addition, 10% of the findings of the control cities with the drug court implementation imposed based on the matched drug court city reached statistical significance. This is suggestive of the fact that the large

decrease in crime rates beginning in the early 1990s is a very powerful influence in the study of crime rates.

According to LaFree (2000), the ability to make any definitive conclusions about crime reducing policy initiatives during the 1990s is confounded by the steadily declining crime rates during those same years. As with the timing of the Martinson (1974) report that declared "nothing works" during a time of steadily increasing crime rates, it is easy to be overly optimistic about the effectiveness of polices implemented during declining crime rates (LaFree, 2000). This fact amplifies the need for more longitudinal analyses of drug courts that control for the powerful time trend in crime rates.

Conclusion

No known prior research on drug courts has examined city-level effects of drug court programs on crime rates. In this paper I attempted to add to the existing research on drug court effectiveness by measuring the impact that drug courts have on drug-related crime rates at the city level. This study has found that although drug courts as a group cannot be shown to have a statistically significant effect on reducing crime rates in their respective cities, there are individual drug courts that reached statistical significance in reducing crime rates, controlling for the existing downward trend in crime over time. While this research was not intended to answer the question "Do drug courts work?", it has provided a promising start to the examination of individual drug court structure's ability to influence city-level crime rates.

Limitations

The goal of this research analysis was to determine the effect that drug courts have on city-level crime rates. However, due to the quality and availability of data there are limitations in the confidence we can have in the conclusions drawn from the preceding analyses. The study suffers from a lack of controls on the dependent variable. I included matched cities, based on the crime rate and population at the first time point in the series, as a similar group of cities to our drug court cities to act as a control group. Due to the simple nature of the matching criteria, it is unlikely that the control group of cities was an exact match to the treatment group and was able to control for all city-level, omitted variables.

Additionally, knowledge about the structure of the drug courts included in the analysis would have provided a framework to compare the effectiveness about specific aspects of drug courts. This would allow for tests to be conducted that examined whether there are certain structural components that are more effective at influencing the desired outcomes than others. Such variables that would be important to be included are size, target population, intensity of supervision, drug treatment programs offered, graduation requirements, eligibility requirements, principle offense charge, case screening, and judicial assignment among others. According to Gottfredson et al., (2003b) there is a great amount of variability in the provision of drug treatment in drug court programs. Only approximately 50% of drug courts in operation offer drug treatment as a requirement of program completion.

The inclusion of variables at the city-level and variables with the characteristics of the drug court would allow for more advanced multiple level

analysis of the effect of drug courts on city crime rates, such as would be possible using a hierarchical linear model. This type of analysis would possibly lend itself to a more accurate picture of what impact drug courts can have at the city-level. However, the collection of this amount and type of data would be very time consuming and expensive to obtain. Moreover, another longitudinal analysis of the drug court impact on crime rates would allow for a better determination of the existing trend in crime rates, and could therefore, be better controlled.

Better knowledge of the link between a drug courts impact on drug use which subsequently influences crime rates would have benefited this study greatly. Unfortunately, the UCR is not a reliable source of longitudinal data of drug crimes (i.e. drug possession and drug trafficking) at the city level. Future analysis of the impact of drug court implementation on these types of drug crimes for use as a proxy for participation in drug activities would then greatly enhance the ability to understand how drug courts could then influence crime rates.

This research design also suffers from some generalizability issues. The results may not be generalizable to cities and drug courts other than those studied in the current examination. Because the data will be collected at the aggregate level, it is important to note that any conclusions could not be applied to individuals, either individual drug courts or participants of the drug court. No predictions can be made about what effect drug courts can have on an individual arrestee's propensity to commit crime.

Future Research

The current analysis could be augmented in some ways that could provide more complete answers to some of the questions posed in this research. A first possibility would be to test the implementation effect on city-level crime rates by variations in drug court type, i.e., comparing different drug court structures. Drug courts are complicated endeavors that must be able to function in a multitude of city environments. As such, drug court structures are flexible and vary across cities. These different drug court models may be associated with different effects on crime rates or may vary in the magnitude of their effect. With the large number of drug courts in existence today, it would be possible for researchers to identify some ideal types of drug courts and compare the different functional form of the drug courts to determine if there are specific features that are the most critical to obtain the desired outcome.

As there are different structural models of drug courts, there are also different city characteristics in which the drug courts operate. All cities have distinct characteristics that are influential, either directly or indirectly, on the citizens that reside in the city. An important factor to include in any future research would be how the environments the drug courts operate influence their success rate. Once participants complete the drug court program they return to the community and to the same compositional and socioeconomic factors they were surrounded with before treatment. These factors may have a significant affect on the success of the drug court program and the recidivism rate of the graduates. Other community and city traits may have an indirect effect on the crime rates, through drug court structures,

such as unemployment rate, poverty level, and other criminal justice and substance abuse reduction policies (Roman et al., 2003).

Policy Implications

Drug courts and the drug court model have been an extremely popular alternative to traditional methods of adjudication in the criminal justice system. Their proliferation across the United States has continued since the first drug court implemented in 1989 to over a thousand that are in operation today and even more in the planning process that are designed to serve different populations and operate in different forms. The current study is an early step in determining which of these drug courts are effective, and if and how drug courts can impact city crime rates. Advancement in this area will help policy makers decide what drug court models will fit best in their city and operate to most effectively achieve the goals they have set for their community and to target those most at risk.

It is important that empirically based evaluations of drug courts are available to help inform policymakers on the best process for implementing a drug court and the ideal structure it should follow to best meet the needs of the community. The results of this study showed that there are specific drug courts that can have an influence on city crime rates. Future research is required to determine what characteristics these cities and their drug courts have that may be different from other cities and drug courts. Results from this future research will be highly valuable to policymakers and key stakeholders in drug courts. While there are other policy alternatives that have been debated in the field and political arena, such as decriminalization, legalization, or other harm reduction policies, drug courts offer the

best alternative to traditional adjudication of drug offenders so long as drug use remains prohibited by law.

The purpose of this study was to evaluate the effects of the implementation of drug courts in cities by evaluating crime rates. Drug courts have garnered considerable attention within the last decade and have become popularized within American society and the political arena. General social sentiments have approved of the drug court paradigm so much that the model has started to be used for other offenses such as domestic violence and drunk driving, among others. With the spread of the drug court model, further rigorous empirical analysis is needed to truly understand the effects of drug courts on drug use and recidivism rates. This study attempted to provide a new look at the evaluation of drug courts and to add a large-scale picture of the state of drug courts, by using time series data from numerous cities across the country. Because of the boom of drug courts in this country, it is important to strive for a better understanding of this phenomenon.

The results found here may not have found conclusive evidence that the implementation of a drug court is able to influence overall city-level crime rates more than just a mere aggregation of individual effects, but the findings are a promising starting point for future research. There are several mechanisms through which drug courts can impact crime rates. As mentioned above, the criminogenic effect of imprisonment and the higher recidivism rates of drug offenders may play a key role in how drug courts can impact the overall crime rate in a city. If drug offenders are responsible for committing a large portion of all drug-related crimes in a city, removing them from the cycle of offending should have an impact on the overall

crime rate. By removing drug offenders from the traditional adjudication process, they are also removed from contact with other offenders in a prison setting where the proliferation of criminal knowledge may take place.

Results from the individual analyses of the drug court cities also show promise for future drug court research. In comparing the percent of total significant findings from the individual ARIMA analyses of the drug court cities to the control cities, it is striking that drug court cities resulted in more than twice as many statistically significant findings. This two to one ratio of statistically significant findings between the drug court cities and control cities suggests that there is likely an influence of drug courts on crime beyond what is expected by chance. These results provide a promising start to future research in the testing of drug courts on crime rates at the city level.

Appendix A: Descriptives for Crime Rate Types by City

Descriptives by City: Property Crime Rate

City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	5476.51	681.54	4347.30	6414.30
Bakersfield, CA	5312.43	979.44	3399.40	6679.20
Boston, MA	3866.50	857.29	2474.10	4841.40
Brockton, MA	4048.80	925.71	2567.80	5178.20
Columbus, OH	5699.94	370.69	4888.20	6263.60
Corpus Christi, TX	7263.86	947.75	5429.80	8299.40
Denver, O	5531.84	1129.40	3837.60	7535.20
Fayetteville, NC	6763.26	896.23	5474.00	8080.20
Flint, MI	6261.65	655.73	4882.30	7159.90
Fort Lauderdale, FL	6838.03	1194.18	4153.30	7898.70
Fort Pierce, FL	5448.34	1156.00	3562.10	7210.40
Gainesville, FL	7909.95	868.66	6024.00	9460.80
Hartford, CT	4405.05	686.26	3357.80	5408.40
Honolulu, HI	5757.68	677.15	4671.30	7300.40
Jacksonville, FL	6811.09	1291.57	3773.80	9033.50
Jersey City, NJ	5338.65	1021.83	3502.90	6600.50
Kenosha, WI	4221.21	980.51	2757.10	5770.50
Little Rock, AR	6667.81	765.40	5439.90	7943.30
Madison, WI	4253.22	821.20	2919.30	5416.00
Milwaukee, WI	4848.37	421.73	4088.70	5543.80
Modesto, CA	5982.97	689.80	4451.70	6942.70
Oklahoma City, OK	7162.01	787.47	5684.40	8643.80
Orlando, FL	6470.28	655.11	5124.10	7618.80
Roanoke, VA	4068.77	808.74	2662.60	5138.30
Saint Joseph, MO	5010.00	398.53	4283.40	5785.20
San Antonio, TX	7906.75	1792.10	5471.60	10297.10
San Francisco, CA	5001.93	843.80	3392.60	5960.10
San Jose, CA	3833.05	795.55	2202.50	4877.70
Shreveport, LA	6939.90	696.87	5633.80	8320.50
Stockton, CA	6623.08	1200.58	4350.60	7863.40
Tacoma, WA	6464.04	572.16	5747.20	7443.10
Tallahassee, FL	7627.16	1176.08	5828.20	9682.20
Waco, TX	6781.76	1022.52	5492.40	8735.00
Washington, DC	4526.26	530.64	3158.40	5113.50

Descriptives by City: Robbery

City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	183.11	57.87	121.80	306.50
Bakersfield, CA	191.75	47.36	100.20	273.40
Boston, MA	206.64	73.91	101.40	305.50
Brockton, MA	157.46	43.66	95.90	208.00
Columbus, OH	270.68	37.32	202.30	324.80
Corpus Christi, TX	130.40	23.16	96.80	174.40
Denver, CO	152.39	34.43	99.20	216.80
Fayetteville, NC	250.33	48.83	172.20	350.30
Flint, MI	295.64	63.46	169.30	431.10
Fort Lauderdale, FL	332.74	84.57	176.90	427.50
Fort Pierce, FL	179.43	38.93	114.40	229.90
Gainesville, FL	251.10	45.08	152.60	304.80
Hartford, CT	211.56	49.99	136.80	274.20
Honolulu, HI	119.86	18.85	96.00	161.80
Jacksonville, FL	347.17	121.01	76.00	484.90
Jersey City, NJ	496.49	96.28	302.50	614.90
Kenosha, WI	87.34	20.78	51.00	134.80
Little Rock, AR	247.99	64.27	133.30	377.30
Madison, WI	80.92	11.36	64.00	97.20
Milwaukee, WI	246.04	58.51	160.50	326.40
Modesto, CA	147.36	20.72	116.50	185.80
Oklahoma City, OK	182.51	30.47	116.60	227.00
Orlando, FL	253.42	40.78	161.40	323.20
Roanoke, VA	108.92	15.11	85.90	135.90
Saint Joseph, MO	49.13	10.14	30.70	64.80
San Antonio, TX	210.43	60.46	117.70	306.30
San Francisco, CA	402.25	108.50	240.80	593.80
San Jose, CA	106.22	21.36	61.80	136.10
Shreveport, LA	224.53	41.41	163.60	301.60
Stockton, CA	293.13	58.66	207.20	379.40
Tacoma, WA	219.81	39.59	165.00	294.50
Tallahassee, FL	284.46	75.76	160.00	408.70
Waco, TX	187.67	46.00	113.70	260.60
Washington, DC	282.15	59.44	171.00	360.90

Descriptives by City: Burglary

City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	887.78	200.65	587.60	1259.70
Bakersfield, CA	1568.12	392.07	900.00	2249.40
Boston, MA	807.68	245.71	407.80	1122.00
Brockton, MA	1096.36	421.75	452.30	1634.10
Columbus, OH	1402.95	138.31	1261.50	1630.90
Corpus Christi, TX	1681.57	474.74	1108.30	2617.00
Denver, CO	1282.10	483.78	664.80	2226.40
Fayetteville, NC	2068.61	344.15	1599.70	2649.50
Flint, MI	1714.39	326.29	1071.10	2200.10
Fort Lauderdale, FL	1660.98	443.40	777.80	2149.70
Fort Pierce, FL	1694.42	514.22	887.00	2461.90
Gainesville, FL	2194.52	451.92	1340.50	2844.80
Hartford, CT	1023.13	288.72	577.30	1411.30
Honolulu, HI	1064.34	160.62	702.40	1296.60
Jacksonville, FL	1900.10	551.97	964.60	2787.90
Jersey City, NJ	1289.23	268.50	769.10	1599.70
Kenosha, WI	897.58	292.99	496.40	1506.30
Little Rock, AR	1603.71	319.55	1014.50	2046.50
Madison, WI	732.27	201.11	458.00	1080.50
Milwaukee, WI	826.23	133.00	596.10	1053.30
Modesto, CA	1583.11	297.46	1003.90	2214.70
Oklahoma City, OK	1840.79	504.31	1077.50	2744.90
Orlando, FL	1810.38	404.22	1153.70	2572.30
Roanoke, VA	747.64	237.80	424.35	1091.40
Saint Joseph, MO	1088.25	303.74	647.40	1676.20
San Antonio, TX	1823.96	752.58	880.80	3047.20
San Francisco, CA	914.01	225.47	537.20	1225.10
San Jose, CA	718.79	224.20	347.50	1185.80
Shreveport, LA	1714.82	318.17	1174.50	2306.20
Stockton, CA	1683.53	502.52	893.10	2430.20
Tacoma, WA	1620.31	531.61	1178.10	2591.20
Tallahassee, FL	2034.74	517.89	1316.50	3046.50
Waco, TX	1869.43	642.94	1002.90	2848.80
Washington, DC	827.48	186.07	451.60	1046.60

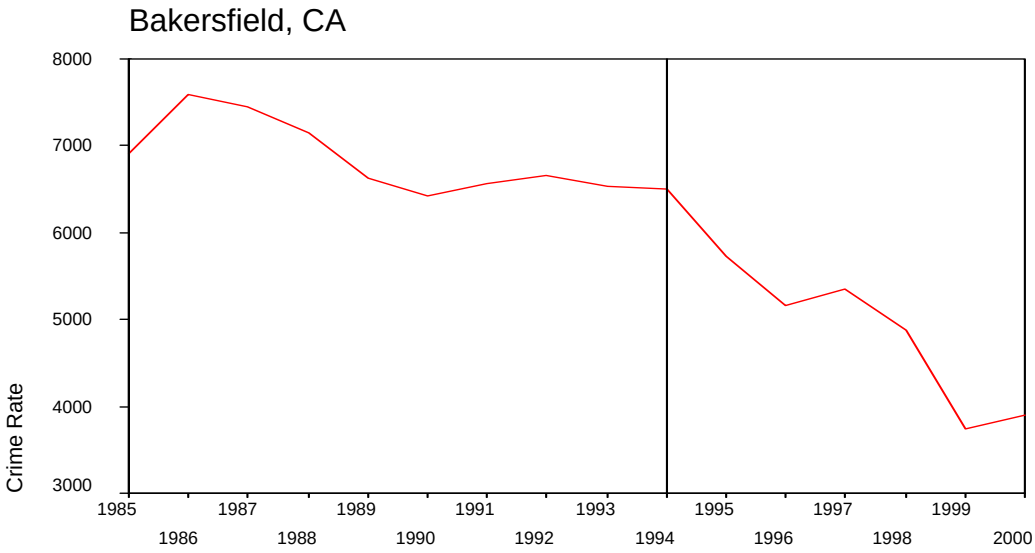
Descriptives by City: Larceny

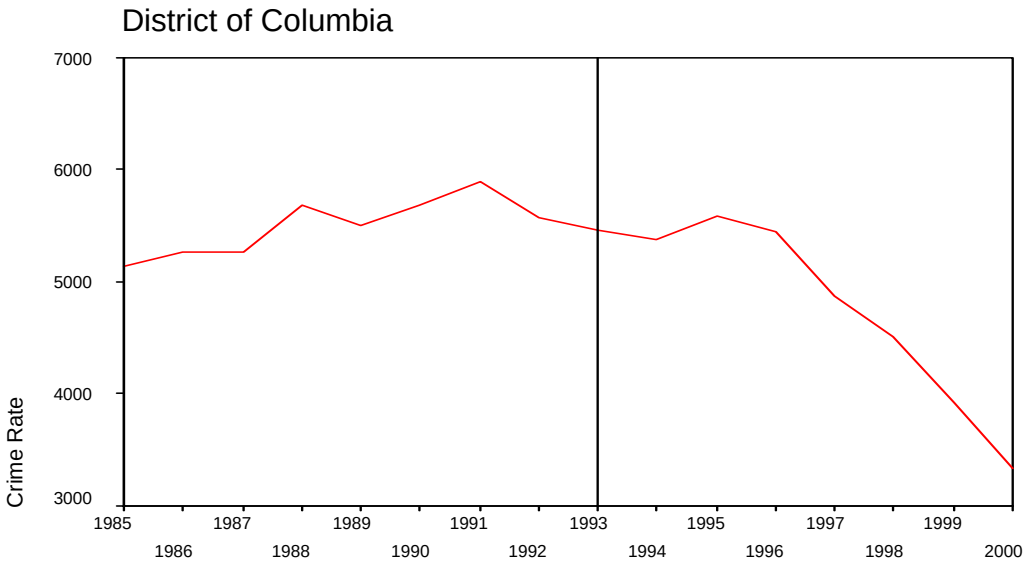
City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	3994.56	433.11	3286.40	4647.10
Bakersfield, CA	3225.10	576.30	2097.70	3930.80
Boston, MA	2243.54	337.90	1639.90	2689.20
Brockton, MA	1973.48	187.87	1600.80	2241.00
Columbus, OH	3717.93	205.20	3283.70	3958.70
Corpus Christi, TX	5163.06	732.83	3874.40	6075.10
Denver, CO	3629.96	635.09	2577.10	4667.10
Fayetteville, NC	4207.78	536.60	3402.40	4965.70
Flint, MI	3762.00	371.50	2965.10	4282.10
Fort Lauderdale, FL	4347.51	721.32	2808.20	5108.10
Fort Pierce, FL	3366.67	595.50	2424.50	4392.10
Gainesville, FL	5216.07	625.51	4127.60	6122.30
Hartford, CT	2848.40	328.28	2380.30	3390.40
Honolulu, HI	4195.45	505.60	3507.60	5304.80
Jacksonville, FL	4308.92	688.18	2579.00	5570.50
Jersey City, NJ	2726.05	462.83	1918.20	3422.50
Kenosha, WI	3055.48	664.40	2067.30	3943.50
Little Rock, AR	4552.47	451.92	3530.90	5235.70
Madison, WI	3273.53	609.55	2264.30	4097.50
Milwaukee, WI	3277.94	203.70	2865.00	3612.30
Modesto, CA	3759.91	430.48	2788.00	4352.40
Oklahoma City, OK	4581.24	368.24	4024.90	5226.90
Orlando, FL	4111.43	304.02	3406.40	4427.90
Roanoke, VA	3133.51	593.48	2041.50	3946.50
Saint Joseph, MO	3667.85	421.63	3038.90	4199.70
San Antonio, TX	5220.90	814.28	4184.90	6381.10
San Francisco, CA	3285.01	486.80	2372.20	3862.20
San Jose, CA	2731.56	532.66	1608.60	3337.40
Shreveport, LA	4805.99	429.03	4097.90	5635.60
Stockton, CA	4105.75	684.66	2886.90	5031.80
Tacoma, WA	4214.54	253.65	3745.50	4629.00
Tallahassee, FL	5017.07	593.76	3946.70	5916.10
Waco, TX	4369.46	492.96	3910.30	5473.20
Washington, DC	3069.31	323.27	2223.20	3458.30

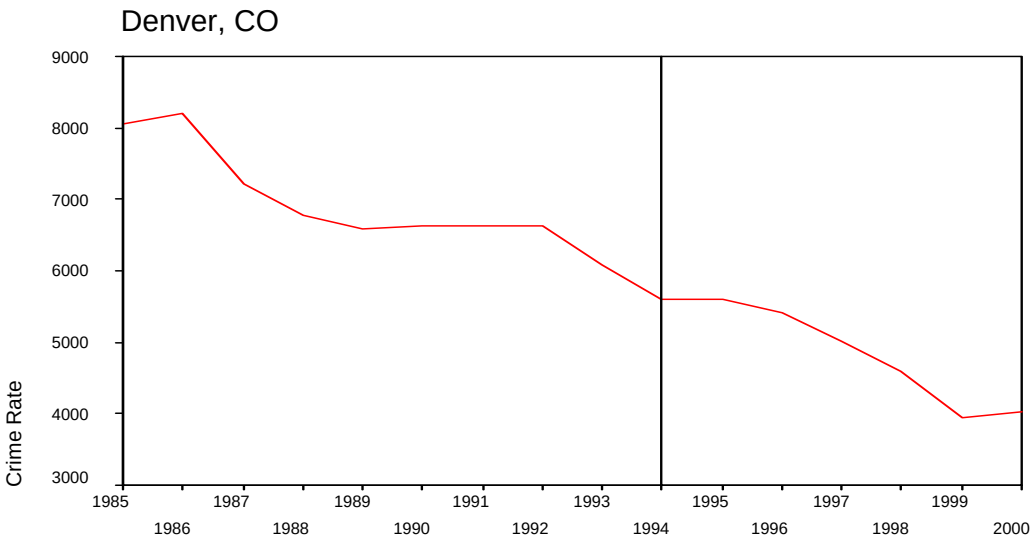
Descriptives by City: Motor Vehicle Theft

City	Mean	Standard Deviation	Minimum	Maximum
Anchorage, AK	595.53	126.21	387.10	863.70
Bakersfield, CA	519.19	91.26	392.50	731.80
Boston, MA	817.16	303.70	386.50	1233.70
Brockton, MA	978.99	366.02	514.80	1607.70
Columbus, OH	579.04	126.55	318.50	757.20
Corpus Christi, TX	419.23	54.85	331.00	540.00
Denver, CO	619.77	68.09	528.90	796.00
Fayetteville, NC	485.48	103.05	337.10	620.80
Flint, MI	785.26	74.38	668.40	935.60
Fort Lauderdale, FL	829.54	139.61	567.40	1009.00
Fort Pierce, FL	388.48	99.30	250.60	577.90
Gainesville, FL	507.78	128.30	289.00	720.20
Hartford, CT	533.52	116.05	362.50	744.70
Honolulu, HI	497.88	154.33	296.30	845.20
Jacksonville, FL	602.08	188.70	230.20	1009.40
Jersey City, NJ	1323.36	330.04	804.80	1769.10
Kenosha, WI	268.17	46.40	181.30	341.80
Little Rock, AR	511.62	141.12	318.60	757.00
Madison, WI	247.42	38.80	186.00	314.50
Milwaukee, WI	744.19	208.57	438.10	1105.40
Modesto, CA	639.94	189.46	358.20	927.70
Oklahoma City, OK	739.99	157.94	459.70	974.10
Orlando, FL	579.39	92.85	379.10	703.10
Roanoke, VA	187.61	15.66	158.60	210.50
Saint Joseph, MO	253.91	42.44	199.30	353.90
San Antonio, TX	861.91	319.37	405.80	1300.30
San Francisco, CA	741.46	189.82	483.20	1031.60
San Jose, CA	382.70	69.74	240.20	466.40
Shreveport, LA	419.09	96.94	295.40	609.20
Stockton, CA	833.80	266.51	441.10	1269.60
Tacoma, WA	629.18	193.37	327.20	922.10
Tallahassee, FL	575.34	230.30	286.10	1119.60
Waco, TX	542.86	129.19	299.80	721.20
Washington, DC	629.47	90.54	483.50	769.80

Appendix B: Time-Series Graphs of Crime Rate for Cities with Reference Lines Indicating Year of Drug Court Implementation






Denver, CO
Crime Rate
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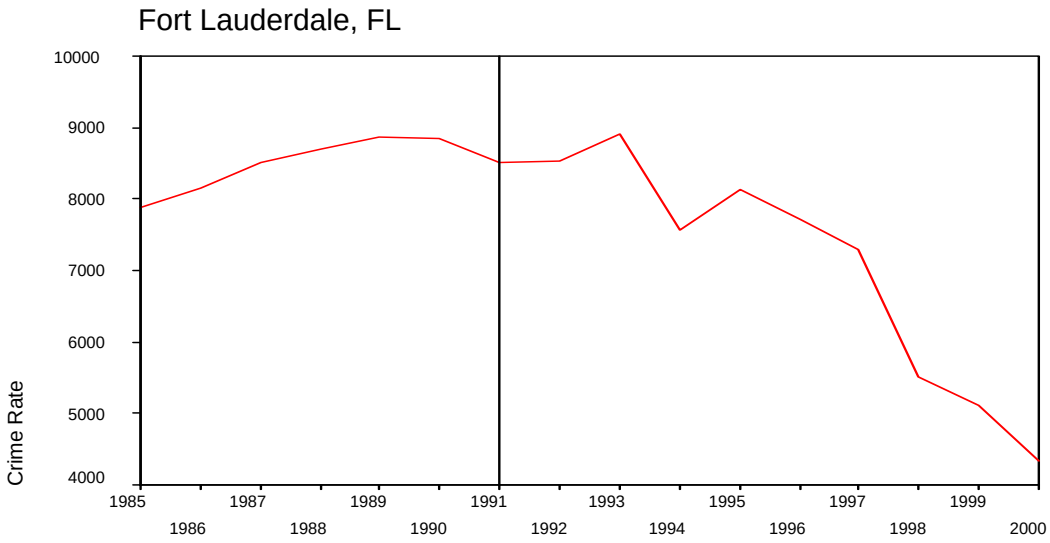
Fort Lauderdale, FL
Crime Rate
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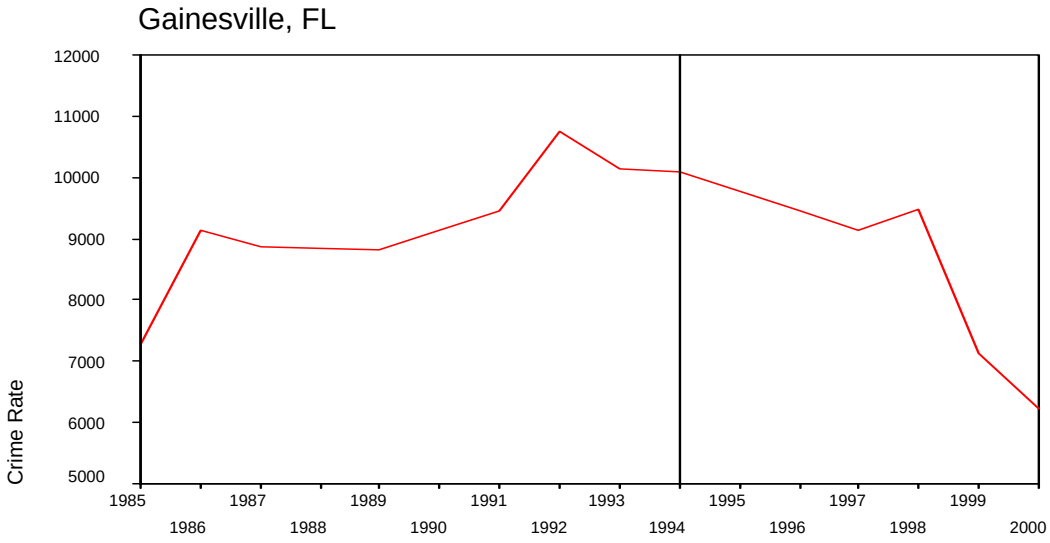
Gainesville, FL
Crime Rate
12000
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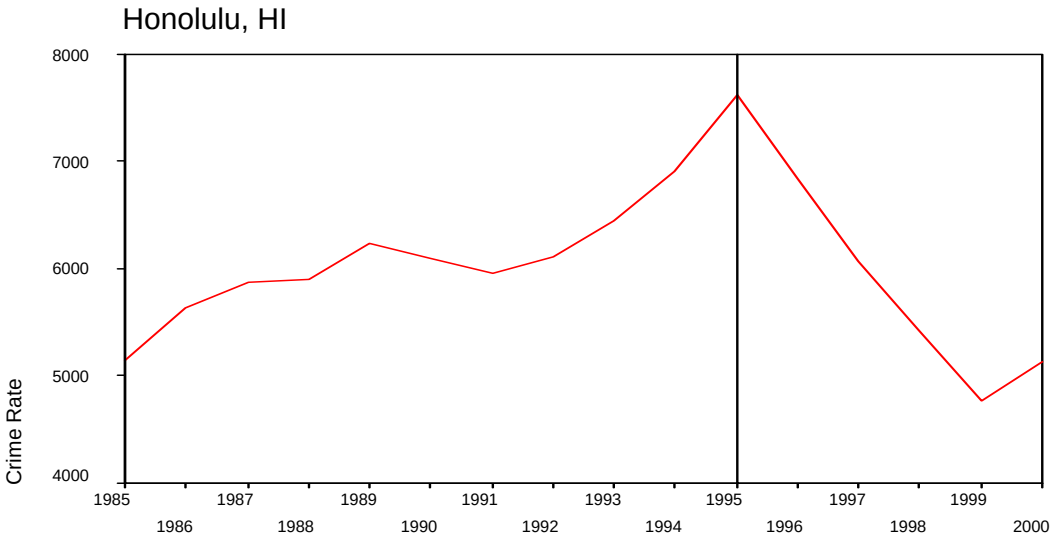
Honolulu, HI
Crime Rate
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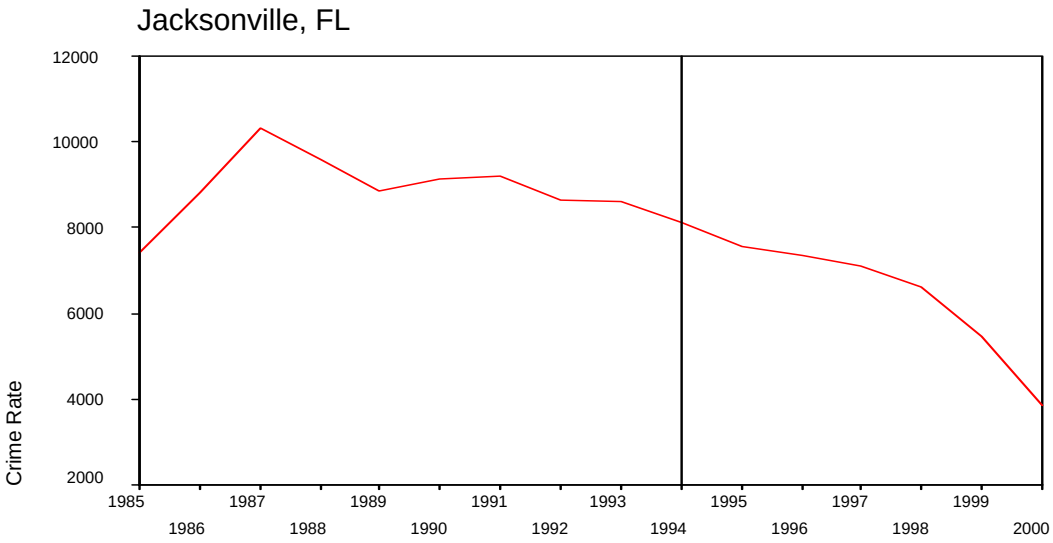
Jacksonville, FL
Crime Rate
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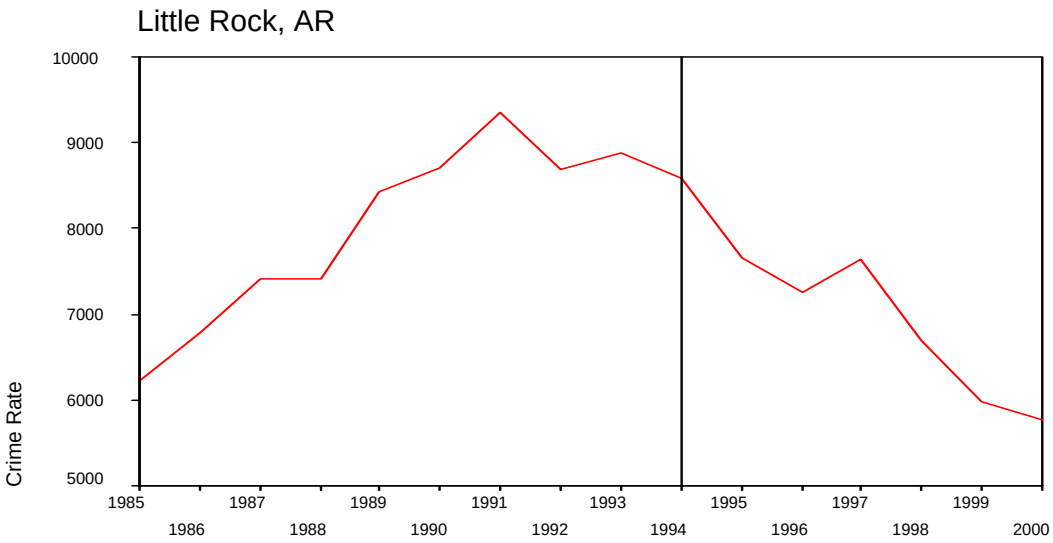
Little Rock, AR
Crime Rate
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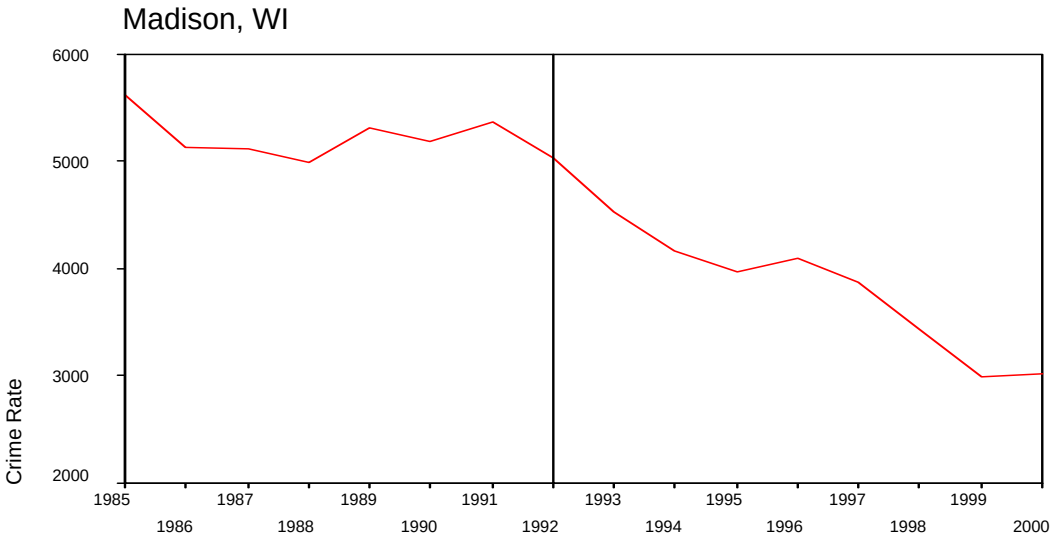
Madison, WI
Crime Rate
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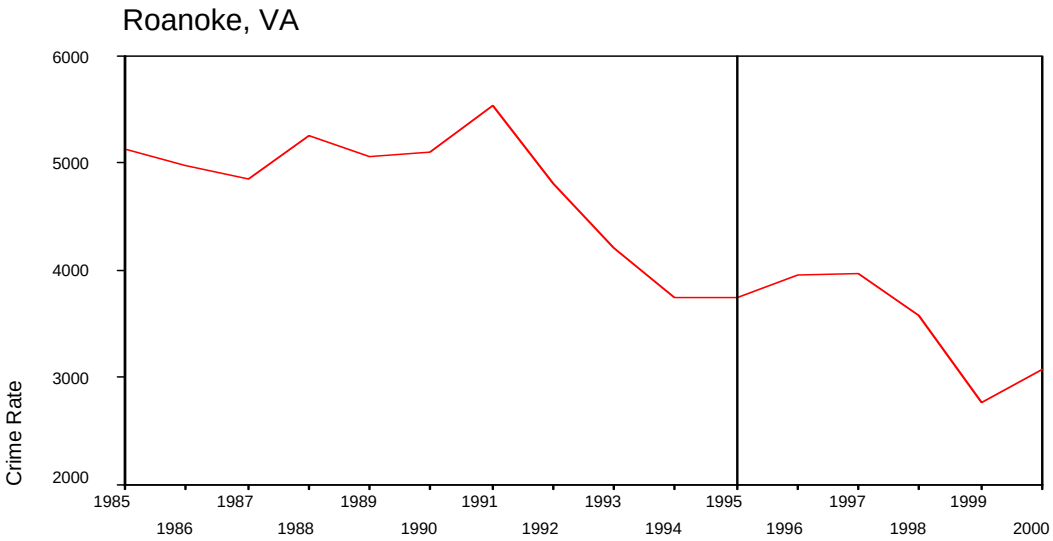
Roanoke, VA
Crime Rate
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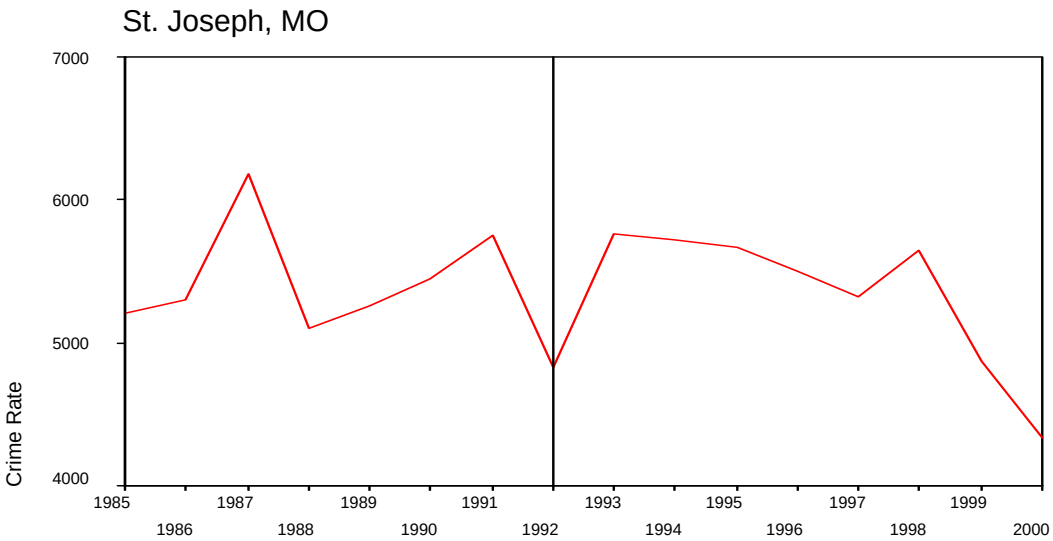
St. Joseph, MO
Crime Rate
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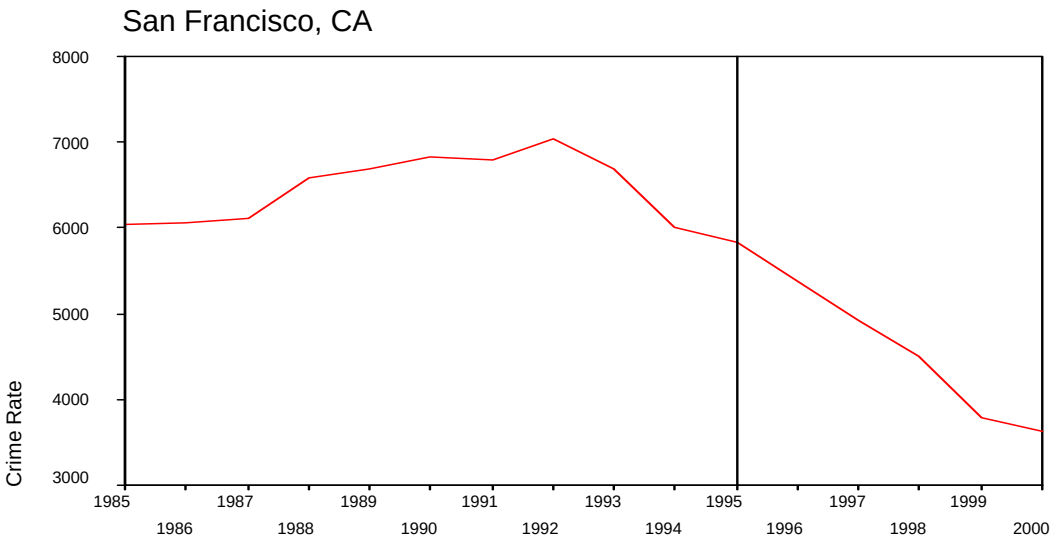
San Francisco, CA
Crime Rate
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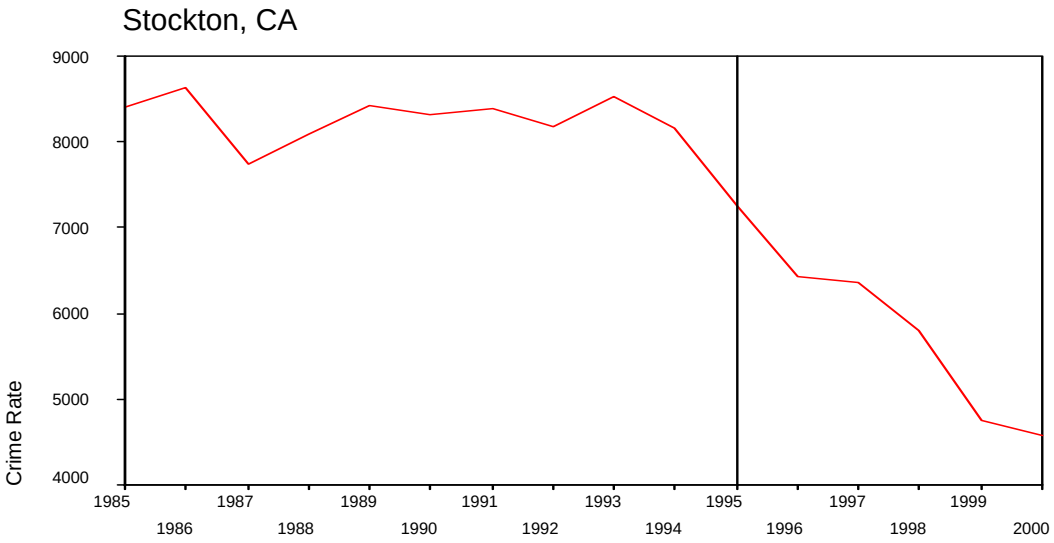
Stockton, CA
Crime Rate
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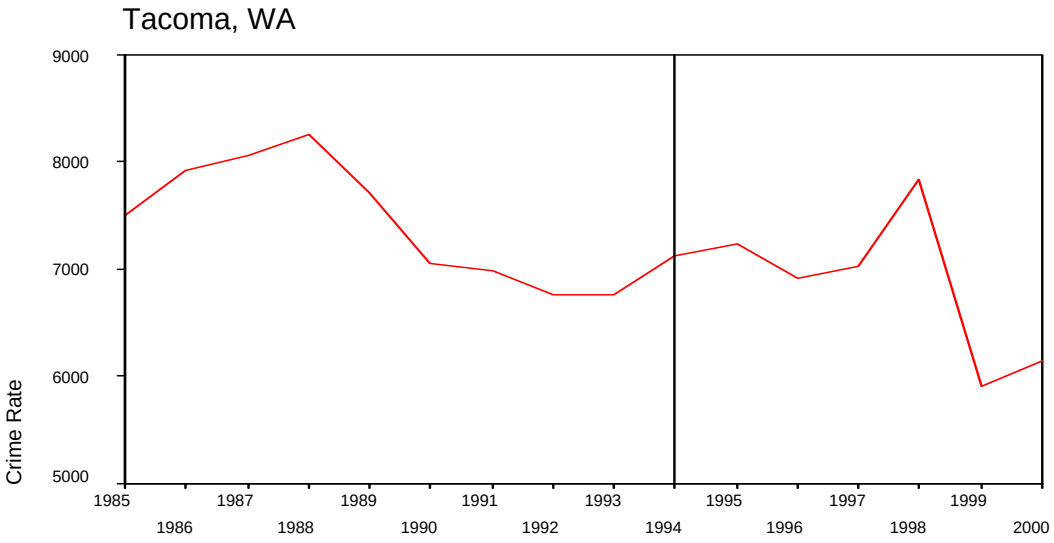
Tacoma, WA
Crime Rate
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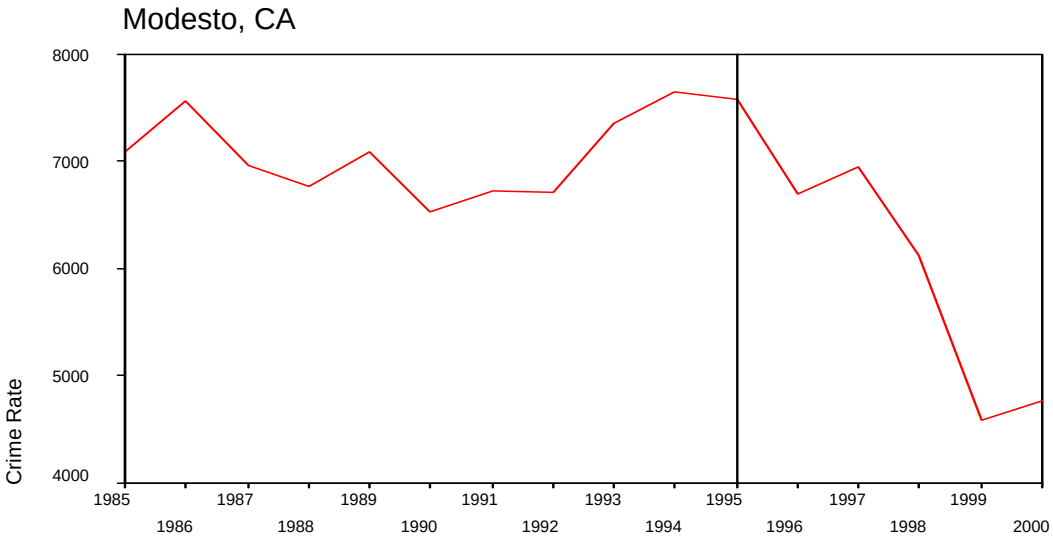
Modesto, CA
Crime Rate
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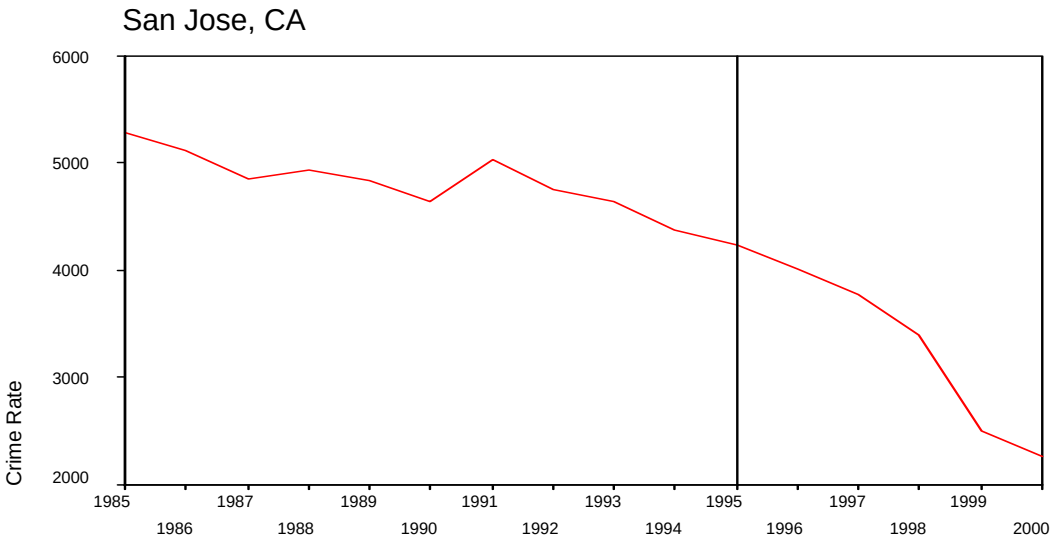
San Jose, CA
Crime Rate
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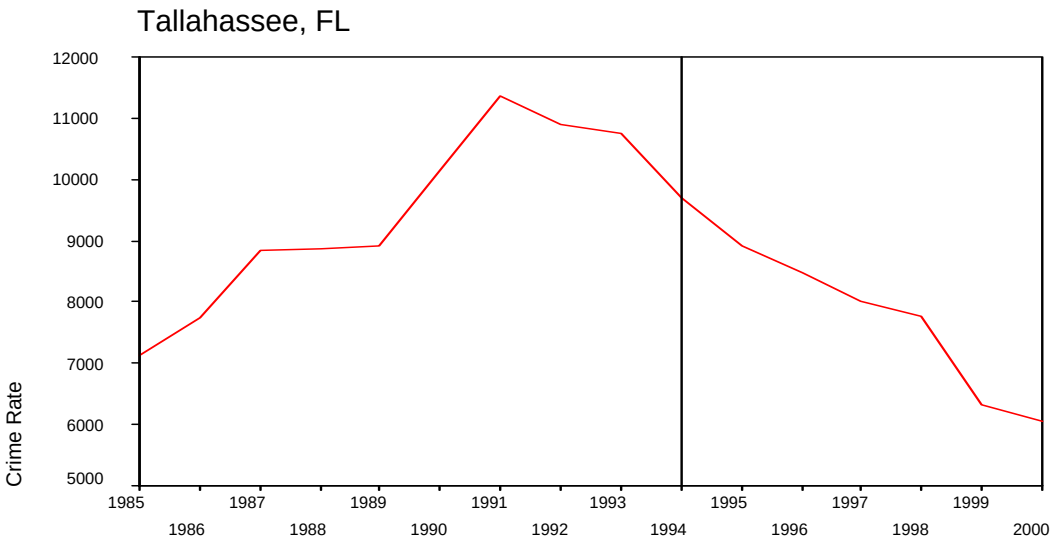
Tallahassee, FL
Crime Rate
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