



REPORT

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CRIME TRENDS AND CRIMINAL JUSTICE POLICIES IN MISSOURI'S LARGEST CITIES

By Sicuro Data Analytics, LLC

ADVANCING LIBERTY WITH RESPONSIBILITY
BY PROMOTING MARKET SOLUTIONS
FOR MISSOURI PUBLIC POLICY



KEY TAKEAWAYS

- Since 2015, violent crime in Missouri, and particularly in Missouri's largest cities, has increased at a higher rate than in other cities with similar demographic and economic trends, pointing to bad policy as a likely cause.
- The increase is especially pronounced for homicides.
- Evidence suggests that progressive policing policies have exacerbated crime problems in the Missouri cities where such policies have been enacted.

OBJECTIVE

This report has several objectives. To set the stage, a description of crime levels over time in the largest cities in Missouri relative to the crime levels in the United States as a whole is provided. Crime in Missouri is shown to be worse than what typically arises across the rest of the country. The first objective, then, is to fully document this divergence. A more nuanced analysis of changes in the crime rates of Missouri's largest cities is conducted to identify when the crime rates in Missouri cities deviated from their expected trajectory. A formal, data-driven analysis is undertaken to estimate the counterfactual crime rate that would have arisen in Missouri's cities had they followed the crime trends common across the rest of the country. The synthetic control method is used to create a "synthetic" version of each city that mimics the historic crime levels, demographics, and socioeconomic attributes of its real-world counterpart as closely as possible and, therefore, provides a basis for estimating their counterfactual outcomes as more-recent policies have been adopted. This analysis provides clear breaks in the trends (i.e., deviations from what was expected from historical data) of criminal behavior in cities across Missouri.

With the point(s) in time when crime rates in cities in Missouri deviated from their expected trajectories identified, the second objective of the report is to explore potential reasons for the difference between expected and actual crime rates. Possible explanations include changes in law enforcement personnel, proxies for law enforcement

effort, changes in law enforcement policies, and changes in prosecution policies and practices. When possible, we provide evidence suggesting which of these potential changes to the criminal justice system best explain the deviations in crime rates.

This report concludes with a series of policy and practical recommendations for reducing violent crime in Missouri. These recommendations are based on the research conducted in this report, previously conducted research on the criminal justice system more generally, and research conducted specifically on the criminal justice system in Missouri.

Sicuro Data Analytics, LLC

*Sicuro Data Analytics, LLC*¹ is a consulting firm with expertise in providing accurate and unbiased data analytics to the criminal justice community. Sicuro is comprised of professional (Ph.D.) computer and data scientists, software developers, economists, and statisticians whose expertise is exclusively focused on examining the criminal justice system. The research team that produced this report has published in top academic publications and has been used widely in addressing some of the most pressing contemporary issues facing the criminal justice system. The research team also has considerable experience in employing the most appropriate and cutting-edge research tools available for analyses of issues in the criminal justice system.

BACKGROUND

The rise in violent crime in the United States has been the subject of persistent contemporary policy discussion. Missouri's cities have not been immune to this growth. For example, Kansas City averaged 121 homicides per 100,000 residents each year over the 2005–09 time period. By 2020 the rate had increased to 196 homicides per 100,000, a 62% increase. Similarly, total violent crime was up 16%.² Homicides in the City of St. Louis in 2020 had increased by more than 85% from the 2005–09 average. In St. Louis

¹ More information about Sicuro Data Analytics can be found at <https://www.sicuroanalytics.com>.

² The values reflect all reported crime in Jackson County, Missouri, and not the entire Kansas City Metropolitan Statistical Area.

County the growth was even more pronounced. While the homicides per 100,000 residents averaged only 34.8 per year previously, 2020 saw 112 homicides per 100,000 (a 222% increase). Similarly, violent crime in St. Louis County increased by 27%.

While the growth in violent crime rates in Missouri is alarming, the question of whether cities in Missouri are trending similarly to cities across the entire United States remains. This report explores whether the growth in crime in Missouri follows national crime trends, or if policies and practices adopted in Missouri have escalated crime to a greater degree than is observed across the rest of the country.

Several steps are taken to conduct the examination of whether crime rates in Missouri are on par with or differ from national crime trends, and especially crime trends in comparable locations. We first examine the data on crime in order to quantify how much violent crime has increased. We focus on urban crime by exploring the City of St. Louis, St. Louis County, Jackson (Kansas City) County, Greene (Springfield) County, and Boone (Columbia) County. To conduct a formal analysis, we use the synthetic control method, which is designed to construct a “synthetic” version of each city from a weighted basket of comparable U.S. cities. In other words, this method is designed to formalize the identification of a city’s peers. Since peer cities will be affected by nationwide trends in the economy and national policy but not Missouri-specific policies, the synthetic city provides a point of comparison that enables the research to determine what crime would have counterfactually looked like in Missouri’s cities. Using this method, we identify whether a divergence has occurred and approximately when the divergence began.

The main body of this document is organized into five sections, as follows:

1. A discussion of research pertaining to the criminal justice system, both generally and specifically as it relates to Missouri.
2. A discussion of crime in Missouri, including changes to criminal justice policies and practices in Missouri over the last ten years.

3. An explanation of the method employed in the analysis.
4. A discussion of the results of the analysis, with separate subsections for homicides, violent crime, and property crime.
5. A series of policy recommendations.

An appendix is also included at the end of the document to explain the synthetic city approach in greater detail.

SECTION 1: RESEARCH ON CRIME AND CRIMINAL JUSTICE POLICIES

Research on criminal justice has grown considerably in recent years as data on decisions related to actors in the criminal justice system have become more readily available. An exhaustive review of research pertaining to the criminal justice system is beyond the scope of this report, but research that conducts meta-analyses or reviews of the research is included. This section begins with a description of the incentives created by the criminal justice system and the trade-offs that can lead some individuals to decide to engage in crime. A distillation of research related to law enforcement and prosecution is then presented. Research specific to Missouri’s criminal justice system concludes this section.

1.1: The Economics of Crime

The economic analysis of crime has a foundation in the seminal contribution of Becker (1968). His central insight was the recognition that the decision to engage in criminal activity can be viewed as a rational calculation weighing the expected benefits and costs. In effect, deterrence can be achieved when an individual recognizes that the expected costs exceed the activity’s marginal benefits.³

The marginal benefits include, most importantly, the subjective utility received by the individual from the illegal activity. While these idiosyncratic, deviant benefits

³ Note that alternative explanations for engaging in criminal conduct exist. For example, Cohen and Felson (1979) propose that “criminal acts require convergence in space and time of likely offenders, suitable targets and the absence of capable guardians against crime.” Nevertheless, the cost–benefit calculation proposed in Becker (1968) still applies to alternative explanations of criminal conduct.

are for the most part unmeasurable, there is evidence that potential criminals are acutely sensitive to changes in the perceived potential benefit of the criminal activity. As an illustration, one source of crime is stealing copper wiring out of buildings. The benefit derived from the theft depends on the price the criminal can obtain when selling the copper. Research has documented that theft of properties escalates when copper prices increase (Brabenec and Montag, 2018).

Also, the marginal benefits only consider the subject's gains beyond the quality of life experienced when not engaging in illegal activity. Using the terminology of economics, the *opportunity cost* of crime matters. Stated differently, individuals who, for example, have careers and earn a higher income have more to lose from engaging in criminal conduct and potentially being incarcerated. A link between crime and the unemployment rate, for example, has been documented (Levitt, 2001).

On the other side of the ledger, the expected costs are made up of two important factors: the severity of the sanction if it were to be imposed and the probability of being punished.⁴

Most typically, the sanction for serious crimes is incarceration. The expected length of the incarceration, then, provides a deterrent effect. In this economic framework, long expected sentences should deter some individuals from engaging in illegal activity. There is substantial econometric evidence that expanded sentence lengths deter. One famous example is evidence from a clemency program in Italy that released prisoners early but required that if they re-offended they would have to serve the remainder of their sentence. Some prisoners were released with only a few months left on their sentence, while others were released with multiple years left to go. Drago et al. (2009) and Barbarino and Mastrobuoni (2014) show that as the additional potential sentence was longer these individuals were less likely to re-offend. Thus, sanctions deter. The probability of receiving this sanction, though, depends on actors within the criminal justice system. This likelihood includes the probability of being caught by law enforcement. Clearly, law

⁴ Some scholars argue that the speed at which a penalty is imposed also impacts criminal conduct. This research is not directly examined in this report, but Nagin and Pogarsky (2001) explore this concept directly.

enforcement deters. In a famous study documenting this, Klick and Tabarrok (2005) used escalated terror alerts in Washington, D.C., which require more law enforcement presence across the city, to show that increases in the number of law enforcement officials on the streets reduce crime. The likelihood of being sanctioned can also theoretically include the probability that the prosecutor's office will pursue a conviction, rather than decline prosecution or dismiss charges, as well as the probability of securing a conviction at trial (or getting the defendant to accept a plea offer).

Discretion and staffing levels of law enforcement can affect the assessed likelihood of being apprehended. Discretion by prosecutors, on the other hand, can affect the assessed likelihood of conviction. Both, according to the economic model of crime, filter back to the potential criminal by changing the expected costs to crime and, ultimately, affect the crime rate. Consequently, we discuss the impact of both of these factors on crime.

1.2: The Role of Law Enforcement Decision-Making on Crime and Public Safety

Identifying the effect of law enforcement on crime and public safety is surprisingly difficult. Law enforcement leadership does not randomly assign patrols geographically or temporally. Instead, law enforcement patrols and other resources are often allocated based on where they are most needed or based on other economic or political reasons. As a result, a naïve analysis that examines the effect of law enforcement on crime, for example, will often find a positive correlation between law enforcement levels and the amount of crime. This is, of course, because law enforcement will be staffed geographically and temporally in locations and at times when crime is most likely to occur, so that law enforcement can quickly respond and increase the safety of the community. This phenomenon is referred to as "reverse causation," because crime rates are dictating where and when law enforcement are staffed, rather than law enforcement determining when and where crime is occurring.

Significant efforts have been undertaken to overcome the issues associated with reverse causation with respect to law enforcement. One of the earliest attempts to determine

the true effect of law enforcement on crime can be seen in Levitt (1997). Leveraging that police hiring levels are higher during election years, Levitt (1997) uses this “shock” to the number of police to examine the impact on crime rates, noting that higher police levels causally lead to reductions in crime rates.⁵ This initial work inspired many scholars to further examine the effect of law enforcement on crime and public safety. For example, DeAngelo and Hansen (2014) examine the effect of a large, unexpected reduction to highway patrol officers, showing that the reduction in law enforcement led to significant increases in fatal accidents.⁶

In addition to examining the effect of law enforcement levels or presence on crime rates, research has also examined the effect of law enforcement response times on various public safety outcomes. Mastrobuoni (2019) examines shift changes in policing and finds that reported crimes that occur during burdensome shift changes are nearly 30% less likely to result in arrests than crimes that do not occur during shift changes. Weisburd (2021) similarly finds that when law enforcement personnel are called away from the police beat that they typically cover to offer backup in another location, the abandoned (i.e., unpatrolled) beat experiences an increase in crime rates. This is attributed to the effect of police presence on the decision to commit a crime. Similarly, Blanes i Vidal and Kirchmaier (2017) find that longer response times by law enforcement in responding to calls for service significantly reduce the likelihood that the crime results in an arrest or identification of a perpetrator. Finally, DeAngelo et al. (2023) examine the effect of police response times on whether a call for service results in an injury, noting that longer response times result in injuries at a significantly higher rate.

1.3: The Role of Prosecution Decision-Making on Crime and Public Safety

Local prosecutors have a substantial amount of discretion when handling criminal cases. They make fundamental decisions such as charge-filing choices, case dismissals, and

choosing whether to plea bargain along with how generous of a plea offer to make. The staff allocation and investment of effort affect error rates, conviction rates, and sentences obtained. Local prosecutors also choose how to prosecute cases and can influence other decisions such as pretrial detainment and judicial sentencing. Prosecutors are clearly integral actors in the criminal justice system.

The questions are whether and to what extent prosecutor decision-making influences crime. One can reasonably be skeptical about the thought that individuals, considering whether to engage in criminal activity, are farsighted enough to form reasonable expectations regarding prosecutor decision-making that will affect them if apprehended in the future. There is reason, though, to believe that prosecutor decisions are consequential and relevant to understanding escalating crime in Missouri’s cities.

First, it is worthwhile to point out that prosecutor office leadership is chosen in popular elections. The United States stands out in the world in its use of elections to select actors in the legal system. No other country in the world uses this institution. Even federal prosecutors are appointed. There is a growing literature showing that the election mechanism strongly influences prosecution decisions. Recognizing the asymmetric information problem that arises between incumbent prosecutors and uninformed voters (Bandyopadhyay and McCannon, 2015), research has shown that prosecution outcomes correlate over time with the head prosecutor’s election cycle. Bandyopadhyay and McCannon (2014), studying prosecutors in North Carolina, provided the first documentation that cases are more likely to be taken to trial rather than plea bargained when the incumbent is up for re-election—with a further increase when that incumbent is challenged in the election. Corroboration of this was provided by Nadel et al. (2017) who documented, using data from Florida, that inflows into jails and prisons correspond to prosecutor election cycles. Electoral distortions have been documented after the wrongful prosecution of the Duke lacrosse players, where the lead prosecutor was running for re-election at the time (McCannon and Wilson, 2019). It has even been shown that election pressures cause an escalation in convictions that are reversed or modified by appellate courts years later (McCannon, 2013).

⁵ McCrary (2002) notes a small error in the work by Levitt (1997) and updates the analysis.

⁶ Bushway et al. (2013) examine the effect of the reduction in highway patrol officers on citations issued by age, noting that middle-aged individuals are the most “rational” in response to the reduction in law enforcement.

This literature documents that case-handling decisions by prosecutors are influenced by election pressures. This is important, as ideological advocates have started providing substantial campaign support for individuals willing to run for a head prosecutor position and adopt a particular set of reforms known as *progressive prosecutors' policies*. Such policies include the elimination of cash bail, termination of staff prosecutors deemed too “harsh,” stopping the pursuit of capital punishment, and promotion of non-incarceration outcomes (Bellin, 2020). Numerous cities across the United States now have progressive prosecutors setting policy. This list includes the elected prosecutors in both the City of St. Louis and St. Louis County.

Refusal to prosecute, dismissal of charges, and generous plea offers can act to disincentivize law enforcement officials. Indeed, Garner and DeAngelo (2023) note that non-prosecution of low-level drug charges resulted in significant reductions in arrests for such offenses. It is reasonable to presume that if prosecutors are not going to make the investments in the arrests made, then police will exercise their discretion and choose to reduce the frequency at which they make arrests. Research has documented that law enforcement responds to incentives. Makowsky and Stratmann (2006) and Makowsky et al. (2019) show that fiscal distress of the municipality influences citations. Even compensation matters. Mas (2006) documents that crime clearance rates adjust after interest arbitration rulings.

If prosecution practices disincentivize law enforcement, then it is reasonable to presume that less intense policing lowers the expected costs of engaging in crime. When the expected costs of crime reduce, then seminal economic theory of crime predicts that, on the margin, more individuals will choose to engage in crime.

1.4: Research on Law Enforcement and Prosecution in Missouri

Much of the recent Missouri-specific research looks at the effects of local economic conditions and crime. For example, Fox et al. (2021) and Han and Helm (2020) examine the relationship between rates of vacant properties in an area and crime. Fox et al. (2021) find that increased vacancy rates in St. Louis are associated with higher concentrations of violent crimes, particularly in the

northern part of the city. Alternatively, Han and Helm (2020) find no correlation between crime rates in Kansas City and foreclosed buildings that have been demolished.

Other research has focused on “market reduction approaches” to reducing crime by reducing the availability of cash, the liquidity of stolen assets, and the anonymity that drive underground economies (Varjavand, 2011). Wright et al. (2017) analyzed this by using the variation in timing of the implementation of the electronic benefit transfer program (EBT) between Missouri counties and counties in surrounding states. They find that the reduction in cash in circulation on the streets is associated with a 9% reduction in the overall crime rate, driven by decreases in burglary, assault, and larceny. Mares and Blackburn (2017) analyze the effect of local ordinances limiting scrap metal sales on crime. As discussed above, the decision to engage in criminal activities such as theft is partly driven by the expected benefits for this activity. Their findings support this by showing that St. Louis’s scrap metal ordinance reduced metal thefts by roughly 50% at the time of publication.

Missouri-specific criminal justice research also looks at the role and effects of law enforcement decision-making. Shjarback et al. (2017) examine policing behavior in the wake of the events in Ferguson by investigating the possibility that police were de-policing (disengaging from their normal duties, possibly in response to public or media scrutiny). The results of the study show that despite a reduction in traffic stops, especially in areas with larger Black populations, there was no appreciable effect of the changes in policing behavior on crime rates. Rosenfeld et al. (2014) present an analysis of a randomized controlled study that investigated the effect of directed patrol (i.e., focusing patrol efforts on specific areas called “hot spots”) and self-initiated enforcement (i.e., officer proactively addresses a perceived public safety issue) on gun violence, finding significant reductions in non-domestic firearm assaults. Kochel et al. (2015) investigate the effects of three patrol methods—a directed approach, a collaborative (mixture of community and law enforcement inputs) approach, and, as a control, standard policing practices—on crime, in addition to the effects on community attitudes toward, and perceptions of, police. Outside of St. Louis, Caplan et al. (2021) researched the effects of an intervention with hot-spot policing in Kansas

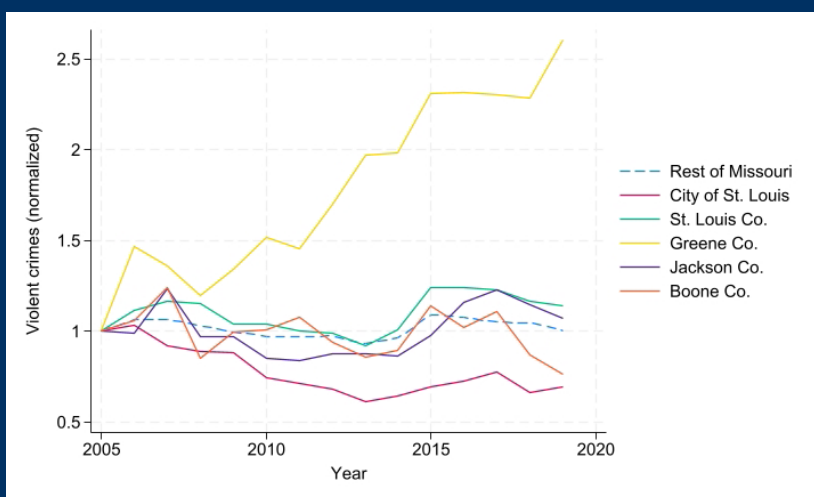
City. Using a data-driven approach to the selection of locations to target, they find that this evidence-based intervention led to a 22% reduction in violent crimes. There is also some empirical research on the relationship between decision-making and crime in Missouri. For example, Barnes et al. (2008) investigate the effects of prosecutors' discretion in death penalty-eligible cases in Missouri from 1997 to 2001. Following from this, Barnes et al. (2009) investigate a subset of their original data and find significant effects of geographic location on prosecutor decision-making regarding whether to seek the death penalty.

SECTION 2: OVERVIEW OF CRIME IN MISSOURI

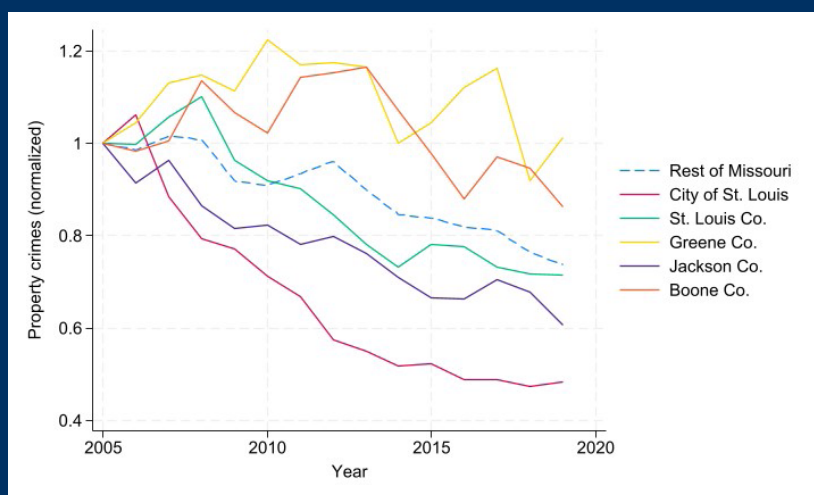
We first present the raw crime data from Missouri separating violent crimes from property crimes. Our analysis focuses on the five urban centers within the state: The City of St. Louis, St. Louis County, Kansas City (Jackson County), Columbia (Boone County), and Springfield (Greene County). Figure 1 compares the total crime in these five areas relative to the amount of crime experienced across the rest of the state (that is, crime in the state of Missouri that does not arise in one of these jurisdictions). Recognizing that these jurisdictions differ substantially in population levels, the crime variables are normalized by their corresponding values in 2005. Normalization is undertaken by dividing each crime variable by its corresponding level for each

Figure 1 Change in Crime in Missouri

Because the rate of change is normalized in the graphs below, the increase in violent crime experienced in Greene County stands out. This is in large part attributable to the lower baseline level of violent crime in Greene County.



(a) Violent Crime



(b) Property Crime

Figure 1 plots the number of crimes per 100,000 population each year between 2005 and 2020. The solid lines are the crime levels for the five jurisdictions studied here (City of St. Louis, St. Louis County, Kansas City, Columbia, and Springfield). The dashed line aggregates crimes across the rest of the state (all jurisdiction not located in these counties). Each value is normalized by the 2005 values. Data from FBI Uniform Crime Reports.

month of 2005. This means that each city has a crime level equal to one in 2005. Values in the following years can be interpreted as percentage point increases in the volume of reported crime relative to the amount observed in that same city in that month of 2005.

Figure 1 indicates differing experiences across the state. Consider, first, violent crime (upper panel). Columbia and the City of St. Louis do not see a growth rate in violent crime over time different from the rest of the state. Kansas City, St. Louis County, and Springfield, on the other hand, record sizeable increases in violent crime relative to the rest of the state. Since Springfield has a lower baseline level of crime, the normalization makes the changes in St. Louis County and Kansas City look smaller, but in absolute levels they too experience large growth.

These trends, though, compare crime within each jurisdiction over time. They do not account for what the crime levels would have looked like had they not been subjected to Missouri's policies. For illustration, violent crime was lower in the 2010s than it was in 2005 in the City of St. Louis, but that decline took place against a backdrop of falling violent crime in large urban areas across the entire country. It is therefore necessary to examine the City of St. Louis relative to other, similar cities before assigning credit or blame to its policies.

Also, importantly, while there are year-to-year fluctuations in crime, the level of violent crime across the rest of the state is essentially the same in 2020 as it was in 2005. For the less-populated counties in Missouri (captured by the dashed lines in Figure 1) crime has not changed much. For some of the large urban areas of the state, though, violent crime has increased dramatically. It is this growth that we seek to explain.

For property crime (lower panel of Figure 1), its volume has declined across the state over the 2005 to 2020 time period. Columbia and Springfield, though, have not benefited from the statewide trend as property crime has remained high. Importantly, again, there is substantial regional variation.

From this analysis, two questions emerge. First, given that there is growth in violent crime in the urban centers within the state, can we identify the policy changes that

may have caused this deterioration? To do so, we will identify when this divergence from the trend in violent crime occurred and then quantify the degree to which violent crime has increased.

Second, given the overall downward trend in property crime in the state, why have some jurisdictions been unable to capture these benefits? To explore this question, we separately consider the more-heavily populated areas of the state, focusing on crime in these five areas. Further, we must first create estimates of the counterfactual outcomes for each city; that is, we need to identify how much crime would have occurred in these areas had Missouri's cities followed trends similar to those observed in other cities in the United States. With these counterfactuals estimated, we can detect breaks in the time trends and quantify the excessive growth in crime.

2.1: Criminal Justice Policy Changes in Missouri

The criminal justice system in Missouri has undergone several policy changes in the past 10 years. In this section, we will outline some of the most significant policy and procedural changes to the criminal justice system that have occurred over this period. The policy changes can be broadly categorized into two areas: law enforcement and sentencing and supervision. In 2014, law enforcement officers were restricted from making arrests outside of their jurisdiction without a warrant. However, this law was seemingly countered in 2016 when legislation was passed that allowed for sheriffs and deputies to respond to requests for assistance in other counties and temporarily be considered law enforcement officers of the county while in that jurisdiction. Also in 2014, mobile recordings on the officer's person or in their vehicle were deemed to be closed record (i.e., content that cannot be obtained via public records request) until an investigation of an incident was completed. Law enforcement officers were also provided immunity from criminal or civil liability for actions taken "while conducting service of process at the direction of any court to the extent that the officers' actions do not violate clearly established statutory or constitutional rights of which a reasonable person would have known."⁷ The criminal code underwent major revisions in 2014 in which crimes were renamed, consolidated, repealed, or re-

⁷ RSMO § 59.095 (2023).

categorized. During this same year, concealed-carry permit regulations of firearms were loosened. Following revisions to the criminal code, 2016 ushered in shifts in correctional supervision including the following:

- Expanded pretrial release and supervision in some counties
- Implementation of tiered sanctions for those under probation supervision that would reduce incidences of revocation of probation
- Adoption of earned good time, in which a person could reduce their sentence length for probation compliance
- Repeal of mandatory life sentences for youth in order to be in compliance with the U.S. Supreme Court *Miller v Alabama* decision, which deemed mandatory life without parole for juvenile offenders as unconstitutional

Sentencing reforms continued in 2017 with statewide sentencing laws changing and certain felonies being downgraded to lower classes. Judicial court reforms accompanied these changes and provided increased support for bond releases for those awaiting trial. In 2018, bond amounts were reduced for those instances in which bond was warranted, and probation officers were co-located at jails to reduce case-processing times. Statewide bond reform continued into 2019, paired with a widespread adoption of risk and safety assessments throughout Missouri counties. The 2017 loosening of certain sentences and correctional sanctions was offset in 2019 with the Missouri Criminal Street Gangs Prevention Act along with increased severity of punishments for nonviolent offenses such as conspiracy charges and for violent offenses such as intentionally causing physical harm or engaging in a felony with a deadly weapon. In some of these cases, sentence lengths were increased by 500%. During this same year, options for exit ramps out of the criminal justice system were legislatively sanctioned when the option of prosecutorial-led diversion became supported by law. Prosecutors were legislatively permitted to divert defendants outside of the criminal justice system when diversion programs (lasting approximately six months to two years) outweigh the benefits of traditional court processing. The Fresh Start Act of 2020 was intended

to broaden opportunities for people with criminal records by disallowing a person from being disqualified from licensure for an occupation solely because of a prior conviction of a crime. In sum, Missouri's 10 years of reforms spanned a broad continuum of policy changes that were both more and less punitive than prior laws making any relative influence of these policies on patterns of crime difficult to discern.

SECTION 3: METHOD

This section examines the period from 2005 to 2020 to determine whether crime in Missouri's biggest cities deviated from the patterns that would be expected based on trends in similar cities throughout the country and, if so, what factors might be responsible for Missouri's unusual performance. To conduct this analysis, this section employs a method in causal inference known as the *synthetic control method*. At a glance, using the City of St. Louis as an example, this method first identifies a set of cities (all with populations over 150,000) throughout the country called a "donor pool" that share some characteristics in common with St. Louis. Specifically, cities in the donor pool are chosen to match St. Louis closely along a set of indicators that includes crime measures and a range of predictor variables (e.g. demographics, poverty, etc.) from 2005 until 2010, which is the period of time when Missouri's homicide statistics track those of the entire country. It is unlikely that any single city in the donor pool will perfectly resemble St. Louis along all dimensions of interest, but the important thing is that these cities must "collectively" resemble St. Louis—that is, it must be possible to construct a "synthetic St. Louis" using a weighted average of the cities in the donor pool that matches St. Louis across all the relevant indicators during the pre-analysis period. One can then simulate the crime patterns from 2010 to 2020 in this "synthetic St. Louis" and compare them to the actual crime dynamics in the true St. Louis. Because any policy changes that occurred in the true St. Louis did not occur in the synthetic St. Louis, it is reasonable to view the difference between these two sets of crime patterns as the effects of policy changes uniquely affecting St. Louis. This same methodology can be applied to other cities in Missouri and to the state as a whole. The appendix gives further technical details on the methodology.

Figure 2

Growth in Homicides Across the Country

Missouri experienced an escalation in homicides starting in (approximately) 2015 and has stayed above the national average since

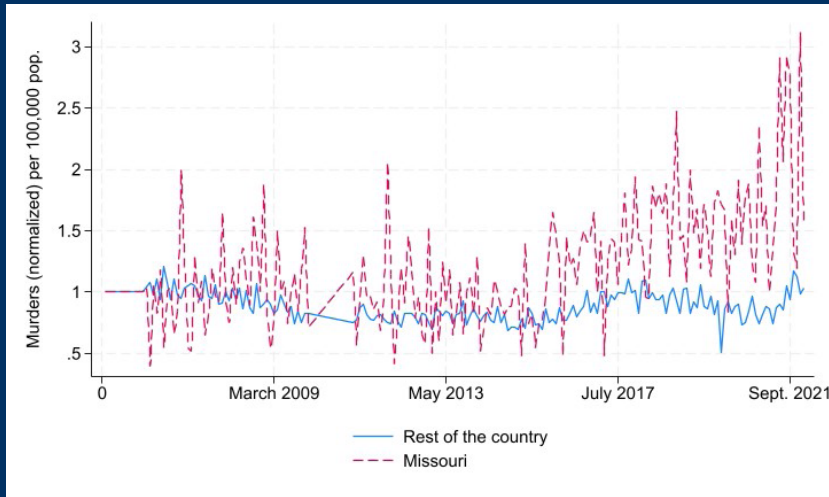


Figure 2 plots the average homicide rate per 100,000 each month between January 2005 and December 2020. The dashed red line is for three Missouri jurisdictions; St. Louis County, the City of St. Louis, and Kansas City (Jackson County). The solid blue line is for the rest of the country. Each value is normalized by the 2005 values. We use the corresponding month in 2005 to account for seasonal variation in crime. Data from FBI Uniform Crime Reports.

While our objective is to study Missouri’s largest cities, the unit of analysis we will evaluate is county-level data. There are a number of reasons why this is appropriate. First, crime data are reported at the law enforcement jurisdiction level. It is a straightforward process to aggregate these results to the county level rather than ascertain which operate strictly within a city’s political boundaries. Second, crime moves freely around an urban center. Criminal actors living in the urban area but outside of the city limits can easily engage in crime within the city. Further, it is well documented that enforcement practices have spatial spillover effects as either “general deterrence” arises (Shavell, 1991), where enhanced enforcement in one area potentially enhances deterrence more broadly, or “displacement” occurs, where enforcement in one area pushes crime to neighboring areas (Johnson et al., 2012). Regardless, considering county-level crime

encompasses total crime. Third, Census-based demographics data are more thoroughly reported at the county level, which aids in the identification of the best matching peer cities for creation of synthetic cities.

SECTION 4: ANALYSIS OF RESULTS

The results of the synthetic control method are presented in this section. The results are broken apart into three outcomes. First, homicides in each city are considered. Second, all violent criminal offenses (excluding homicides) are considered, as violent offenses are a proxy for the safety of the community. Finally, property crimes are analyzed, which could be important when considering the safety and vitality of businesses and citizens in these communities.

4.1: Homicides

Our analysis begins by determining whether and when the homicide rate in Missouri has diverged from national trends. As popular media outlets have noted (Salter, 2020, Stebbens, 2021), the recent rise in homicides across the country raises serious concerns about community safety, which is the reason that this most-pressing crime type is the first investigated in this analysis. To illustrate the concern, Figure 2 depicts the monthly homicide rate across three cities in Missouri (dashed red line) and the homicide rate per month across the rest of the counties in the United States used in this dataset (solid blue line). The homicide rate is normalized by that month’s value in 2005 so that the time series depicts the growth rate, which recognizes seasonal variation.

A clear divergence arises. The homicide rate in Missouri for approximately 125 months was similar to what was

observed in the rest of the country. While there has been a modest growth in the homicide rate across the United States in the last few years, Missouri experienced an escalation in homicides starting in (approximately) 2015 and has stayed above the national average since. Therefore, it appears that an important factor is causing Missouri to experience an above-average homicide rate compared to the rest of the United States.

Figure 3 illustrates the estimated growth in the homicide rates using the results from our estimation procedure. The difference between the actual city's value and the synthetic unit is estimated for each year. Positive values represent escalations in homicide beyond what occurs in the city's "peers" in that year. The 95% confidence intervals are included to assess the statistical significance of the estimated effect.

A number of important observations arise from these figures. First, in St. Louis there has been a noticeable increase in homicide relative to predicted levels. Prior to 2015, there is not an important difference between the city and its synthetic counterpart. After 2014, though, a dramatic growth occurs, and that growth has been consistent through 2020. It seems that, starting in 2015, the homicide rate has differed from what the rest of the country has experienced. This is true for both the City of St. Louis and St. Louis County.

Similarly, Kansas City also experienced disproportionate growth in its homicide rate. While the escalation starts around 2015, it can be statistically distinguished from a null result only after 2017. Nevertheless, the increase in the homicide rate in Kansas City mirrors the results seen in both the City of St. Louis and St. Louis County. Columbia and Springfield display noticeably different results from the other three locations; the homicide rates for these two cities over time cannot be distinguished from the counterfactual synthetic version of each city. This suggests that factors occurring in specific locations (the City of St. Louis, St. Louis County, and Kansas City), rather than statewide policies, are causing homicides to increase, as Boone and Greene counties are not experiencing an unusual rise in the homicide rate relative to the experiences of similar cities.

It is also valuable to estimate the average treatment effect, which is the average per-year growth in the homicide

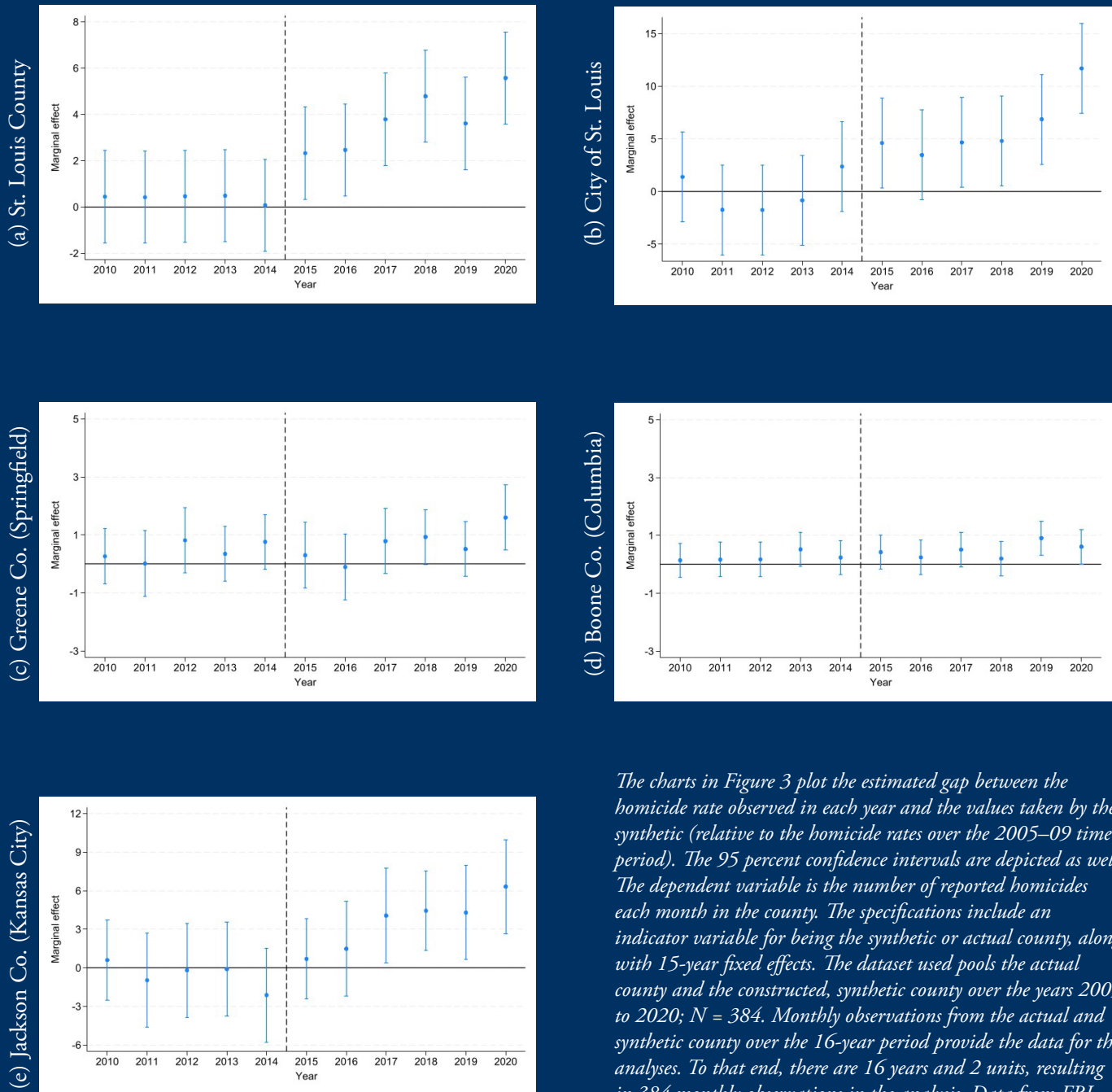
rate due to implemented policies. To do this, a standard difference-in-differences model is estimated. This method first recognizes that jurisdictions that are subject to Missouri's policies may be different in numerous ways. Recognizing the baseline discrepancies in the volume of crime, the model estimates whether this difference expands or contracts over time. The degree to which the difference changes becomes the estimated policy effect. Hence, a difference-in-differences estimation accounts for the difference between the actual county we are studying and the synthetic version of that county created. The method also accounts for the difference in criminal justice outcomes, for both the actual and synthetic, prior to the identified break in 2015 relative to years after the break (i.e., the "post" period). Having controlled for those differences, the coefficient of interest is whether the difference between the actual and synthetic county expands or contracts in the post period (i.e., Actual county \times Post). The coefficient on this variable is the estimated treatment effect where positive values represent a disproportionate increase in that crime variable after 2015 and a negative coefficient suggests that the homicide rate has reduced in that country relative to its counterfactual outcome. Table 1 presents the estimates for each location.

Each location demonstrates an increasing gap between actual and predicted homicides. In St. Louis County, for example, the coefficient estimate of 6.07 means that there have been just over six additional homicides per 100,000 residents each year since 2015, relative to the crime rates in the synthetics. Given that the pre-2015 homicide rate was only 2.64 homicides per 100,000 residents, this represents more than a 230% increase. Being statistically significant at the 1% level (denoted with *** in Table 1) implies that we can be more than 99% sure that this is not, in fact, a zero effect.

For the City of St. Louis the homicide rate has grown by almost 50% per year since 2014. Similarly, Kansas City's homicide rate has increased by over 60% per year. Table 2 shows that Springfield and Columbia, which appear in Figure 3 not to deviate from predicted patterns based on their synthetic counterparts, actually exhibit a slight increase in homicides relative to predictions. However, relative to the low baseline level of homicides in these cities, the implied growth is still 48 and 63%, respectively, for these two cities.

Figure 3
Escalating Homicides in Missouri

A clear divergence is shown, where homicide rates in St. Louis County, the City of St. Louis, and Kansas City increase relative to nationwide trends. No such increase is noted in Columbia or Springfield.



The charts in Figure 3 plot the estimated gap between the homicide rate observed in each year and the values taken by the synthetic (relative to the homicide rates over the 2005–09 time period). The 95 percent confidence intervals are depicted as well. The dependent variable is the number of reported homicides each month in the county. The specifications include an indicator variable for being the synthetic or actual county, along with 15-year fixed effects. The dataset used pools the actual county and the constructed, synthetic county over the years 2005 to 2020; $N = 384$. Monthly observations from the actual and synthetic county over the 16-year period provide the data for the analyses. To that end, there are 16 years and 2 units, resulting in 384 monthly observations in the analysis. Data from FBI Uniform Crime Reports.

4.2: Violent Crime

In this section we examine how violent crimes (as defined by the FBI's Uniform Crime Reports) other than homicide in Missouri locations have evolved over time. The methods discussed in the previous section are employed here where we use the created synthetic version of each county to serve as baseline as to what the crime would have looked like in these areas of Missouri, but total violent crimes per 100,000 residents is the measure of the outcome variable of interest, rather than the homicide rate. Further, this allows us to assess, formally, the observations made looking at the raw data in the top panel of Figure 1.

Similar to the homicide rate, the violent crime rate in St. Louis County spikes starting in 2015 and stays consistently higher than what would have been expected. Springfield also experiences an increase. The divergence in Springfield begins a few years earlier than in St. Louis County. Kansas City also shows a modest increase in violent crime relative to its peers (as measured by its constructed synthetic). In contrast, violent crime in

Table 1: Estimated Average Treatment Effects: Homicides

	St. Louis County (1)	City of St. Louis (2)	Jackson County (Kansas City) (3)	Greene County (Springfield) (4)	Boone County (Columbia) (5)
Actual county x Post	6.07*** (1.03)	3.57*** (0.48)	3.86*** (0.88)	0.66*** (0.24)	0.36** (0.14)
R ²	0.57	0.35	0.53	0.09	0.09
Dependent variable mean	2.64	7.25	6.19	1.38	0.57

Results from a difference-in-difference specification. The data pool the actual city and its synthetic over the 2005–20 time period using the number of violent crimes per 100,000 population as the dependent variable; $N = 384$. An indicator variable for being an actual or synthetic observation is included along with a post-treatment indicator variable. The final row provides the dependent variable's mean for the pre-treatment periods (2005–14). Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance. Data from FBI Uniform Crime Reports.

Table 2: Estimated Average Treatment Effects: Violent Crime

	St. Louis County (1)	City of St. Louis (2)	Jackson County (Kansas City) (3)	Greene County (Springfield) (4)	Boone County (Columbia) (5)
Actual county x Post	61.70*** (13.42)	-37.66 (32.83)	233.50*** (82.70)	80.40*** (7.20)	1.79 (2.63)
R ²	0.15	0.61	0.22	0.61	0.73
Dependent variable mean	256.76	365.55	473.85	192.14	75.36

Results from a difference-in-difference specification. The data pool the actual city and its synthetic over the 2005–20 time period using the number of violent crimes per 100,000 population as the dependent variable; $N = 384$. An indicator variable for being an actual or synthetic observation is included along with a post-treatment indicator variable. The final row provides the dependent variable's mean for the pre-treatment periods (2005–14). Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance. Data from FBI Uniform Crime Reports.

the City of St. Louis and Columbia appear to be consistent with what would be predicted by the patterns in similar cities, as neither has a statistically significant coefficient. The average treatment effects are estimated and presented for each location in Table 2.

The growth depicted visually for St. Louis County, Kansas City, and Springfield arises again in the average treatment effect estimations. The coefficient of 61.70 for St. Louis County, for example, means that there have been approximately 62 more violent crimes per 100,000 people per year in St. Louis County than what arose in its synthetic each year since 2015. The violent crime rate in St. Louis County is estimated to be 24% higher each year after 2014 than what it would have been if it had followed the trends of similar peer locations. Likewise, comparing the coefficient estimates in Table 2 to the mean violent crime rate prior to 2015, Kansas City's estimated, statistically significant change is a 49% increase per year after 2014 relative to its synthetic. Springfield is estimated to have a 42% increase in violent crimes per year after 2014. The City of St. Louis and Columbia, on the other hand, record essentially zero divergence from their peer locations.

4.3: Relevant Potential Drivers

4.3.1: Violence in Ferguson

The data reveal that St. Louis County, in particular, has seen an escalation in violent crime broadly. This shows up in both total violent crime as well as murders. Interestingly, the break seems to occur around 2014 or 2015. This is noteworthy, as Ferguson is located within St. Louis County, and the death of Michael Brown occurred in August 2014. Therefore, a reasonable conjecture is that this is not coincidence. As one possibility, heightened violence arose from residents in Ferguson as a result of the death. A second possibility is that police responded with heightened enforcement in these areas, which led to more violent crime being responded to by law enforcement.

We therefore dig deeper into St. Louis County's data. We disaggregate crimes reported by the Ferguson police department from the rest of the law enforcement jurisdictions in the county. Figure 4 considers the homicide rate, violent crime rate, and property crime rate in Ferguson.

Clearly, both the number of murders (top left panel) and total violent crime (top right panel) increased in the years following the Michael Brown incident in Ferguson. The increase in Ferguson is substantial. Interestingly, violent crime and homicides specifically increase across the rest of the county. Property crime, on the other hand, is relatively stable, experiencing a slight downward trend. Importantly, though, the reduction in property crime in the rest of the county arose prior to the Michael Brown incident. Ferguson did not follow the county in this decrease, though, after the incident.

It is uncertain to what extent the Michael Brown incident explains trends in the county-level violent crime. Crimes reported by the Ferguson police department make up fewer than 4% of the total number of violent crimes in St. Louis County. Thus, even a substantial increase in violent crime in Ferguson only accounts for a small percentage change in the total number of crimes in the entire county.

This means that either the Michael Brown incident is not driving these aggregate trends or, more likely, it is that a spillover effect arose where violent crimes increased in neighboring jurisdictions within the county. The Michael Brown incident may have spurred the spike in homicides and violent crime in Ferguson in the years just after the event. Nevertheless, the event and the immediate response are not sufficient to explain the persistent and countywide increase in violent crime. Undoubtedly, some of the turmoil may have spilled over into other municipalities as the event impacted the region. We cannot rule out the possibility that the Michael Brown incident led to systemic or cultural changes countywide.

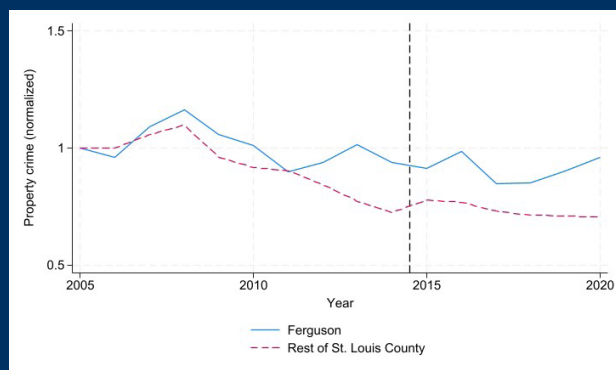
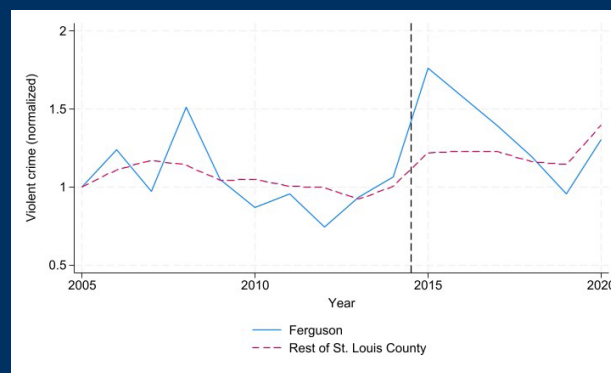
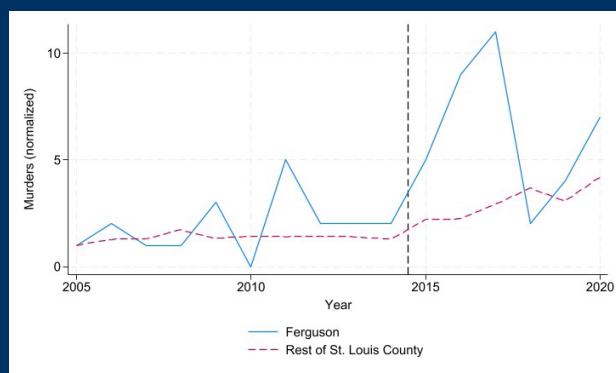
4.3.2: Progressive Prosecution

Another potential explanation for the rise in violent crimes is the installation of *progressive prosecutors*. As discussed previously, progressive prosecutors adopt a number of policies intended to promote equity while decreasing the harshness of sanctions. According to the economic theory of crime, these policies should have a negative impact on deterrence.

In 2016 Kimberly Gardner was elected prosecutor for the City of St. Louis. In her role, she reduced the use of cash bail and expanded the use of diversion programs, among other policies adopted. By 2019, 100% of the prosecutors

Figure 4 Ferguson

In the three crime categories measured, Ferguson experienced more crime than the rest of St. Louis County as a whole. The difference was less pronounced, however, with regard to property crime.



The graphs in Figure 4 plot the crime in St. Louis County, disaggregating crimes in Ferguson from the rest of the county. The amounts are normalized by their 2005 values. Data from FBI Uniform Crime Reports.

in her office when she began her term had either left or been fired. Ms. Gardner received support from Real Justice PAC in her election efforts. Real Justice is a political-action committee with the aim to “promote left-of-center policing and criminal justice policies.”⁸ It claims to be “up against ultra-wealthy conservative donors, racist police unions, and corrupt politicians.”⁹

Political response arose right away. Some have claimed that the City of St. Louis’s prosecutor office created an “exclusion list” of St. Louis police officers from whom the office would not consider evidence or testimony (Kohler

and Krull, 2020). Also, in an invasion of privacy case, Ms. Gardner’s office obtained a grand jury indictment against the then-sitting Governor of Missouri, Eric Greitens. Governor Greitens filed a police report against the investigator hired by Ms. Gardner’s office for perjury.

A special prosecutor was appointed to investigate criminal misconduct by the City of St. Louis’s prosecutor’s office. Eventually, the investigator hired by Ms. Gardner pled guilty to evidence tampering. Ms. Gardner subsequently filed a civil rights lawsuit against the City of St. Louis and the St. Louis Metropolitan Police Department alleging a racist conspiracy.

⁸ <https://www.influencewatch.org/political-party/real-justice-pac>.

⁹ <https://www.realjusticepac.org>

In 2018 Wesley Bell was elected as the prosecuting attorney in St. Louis County. A former public defender, Bell's campaign platform included expanding diversion programs, mitigating the use of cash bail, non-use of capital punishment, and special prosecutors for homicide investigations in which the accused are police officers. He too received financial support in his election from Real Justice PAC.

Conflict between Mr. Bell and his prosecution staff was immediate. In the month prior to his taking office, the assistant prosecuting attorneys voted to join the St. Louis Police Officers Association, a local law enforcement fraternal order.¹⁰ Within hours of taking office Mr. Bell fired numerous prosecutors within his office.¹¹ This action resulted in the county having to pay a wrongful termination settlement.¹²

Progressive prosecution was built on the idea that criminal justice reforms were necessary to correct what was perceived to be an overly harsh system. Central to this concern is the disparate outcomes experienced by racial and ethnic minorities. Some argue that the flawed relationship between law enforcement and the community is the root cause of many problems. In an effort to promote equity, progressive prosecution looked for non-incarceration outcomes. Diversion programs and deferred prosecution could, theoretically, reduce recidivism that may come from convictions driving individuals out of the labor market.

There is good reason, however, to believe that the actions of progressive prosecutors have a deleterious effect on crime deterrence. First, one would anticipate that the expected sanctions reduced the chance that the prosecutor's office pursues the conviction. Searching for mitigation in punishment also reduces the expected sanctions. Economic theory predicts these should act to harm deterrence. Also, the progressive prosecutor policies

¹⁰ Lacy, Akela. "Before criminal justice reformer is even sworn in, St. Louis prosecutors have joined a police union." *The Intercept*, December 20, 2018. <https://theintercept.com/2018/12/20/wesley-bell-st-louis-prosecutor-police-union>.

¹¹ "Wesley Bell, new St. Louis County Prosecutor, fires some staff." *KMOV.com*. Associated Press.

¹² Currier, Joel. "Third prosecutor forced out by Wesley Bell gets \$70,000 settlement with St. Louis County." *St. Louis Post-Dispatch*, August 24, 2019. https://www.stltoday.com/news/local/government-politics/third-prosecutor-forced-out-by-wesley-bell-gets-70-000-settlement-with-st-louis-county/article_9a07d388-9c43-5164-9ca3-fbe4ecf38f35.html.

also create conflict with law enforcement. If they are disincentivized, then there is a further reduction in the probability of apprehension, which erodes deterrence.

Returning to the data, violent crime in the City of St. Louis is below its 2005–09 levels throughout the 2010–20 time period. It does begin to rise in 2017 so that it is indistinguishable from zero (the 2005–09 baseline) by 2019. Therefore, it is reasonable to hypothesize that progressive prosecution practices eroded the improved violent crime levels achieved in the decade prior.

Violent crime in St. Louis County, on the other hand, spikes in 2015 and stays above zero (or rather, above the 2005–09 reference time period) throughout the rest of the 2010s. Interestingly, as one can see in panel (a) of Figure 5, the 2015 spike is eroding in 2017–19. This downward trend is reversed for 2020. Thus, while it seems unlikely that progressive prosecution policies caused the initial growth in violent crime, we cannot rule out that these policies may have contributed. Or, at the very least, they do not appear to be helping decrease violent crimes.

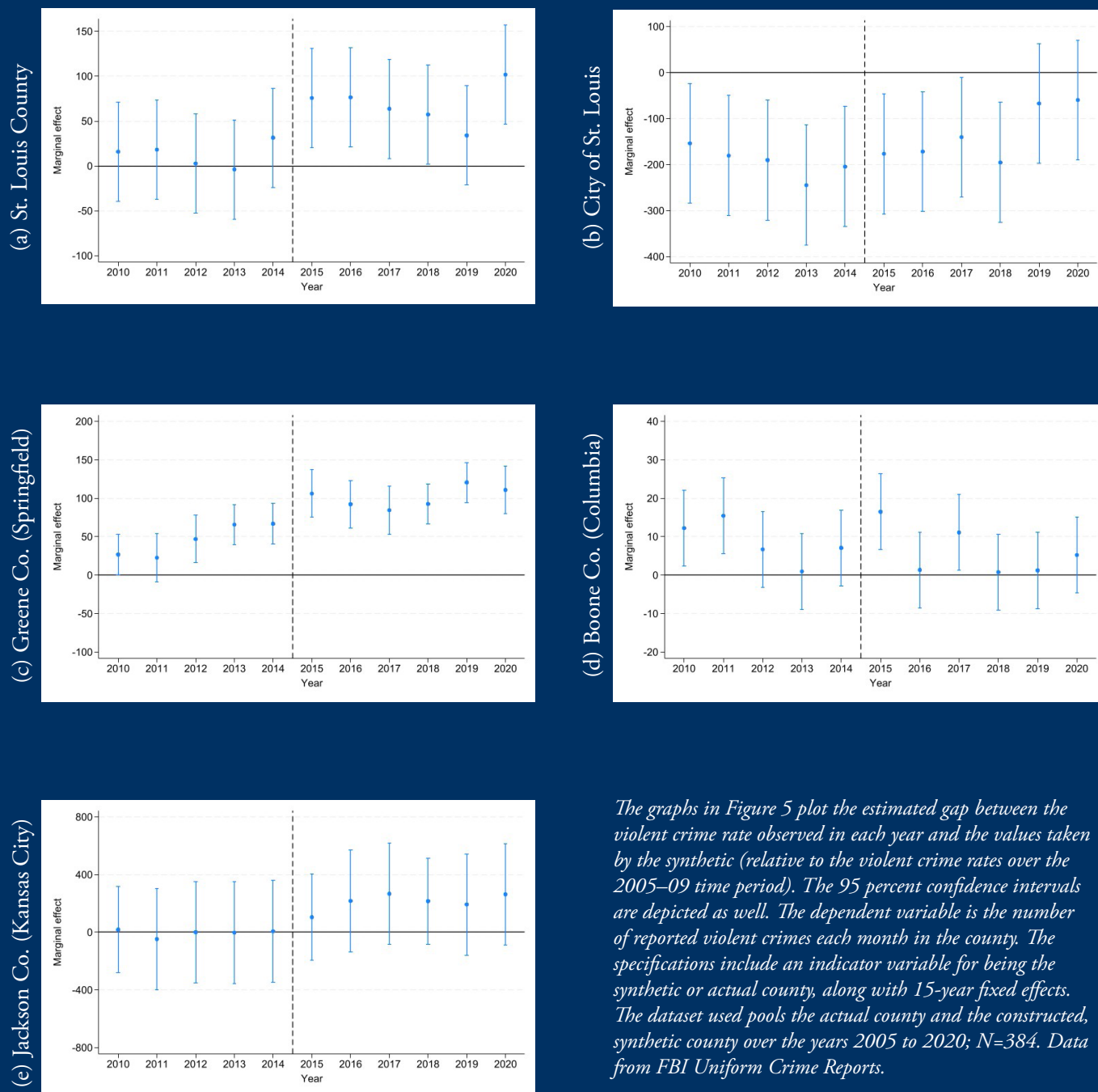
4.4: Property Crime

Up to this point, the analysis has focused on violent crimes. It is worthwhile to explore property crimes as well since they can affect the safety of both citizens and businesses. The analysis that produced Table 2 is replicated in Table 3, but total property crimes are examined as the outcome variable of interest.

The results show that property crime is not statistically different in St. Louis or Kansas City as compared to their synthetics. The regional trends in property crime match the rest of the country for both locations. Property crime in Springfield and Columbia, on the other hand, has grown relative to what would have been predicted from their synthetics. Considering column (5) of Table 3, for example, compared to the 2005–14 average, property crime in Columbia has increased 5.6%. The increase in property crime in Springfield, though, is rather small as the growth has been only a 0.6% increase from the average. Hence, we focus on factors that have influenced the rise in property crime in Columbia.

Figure 5 Escalating Violence in Missouri

St. Louis County, Springfield, and (to a somewhat lesser extent) Kansas City saw an increase in violent crime relative to the rest of the nation beginning in 2014–2015.



The graphs in Figure 5 plot the estimated gap between the violent crime rate observed in each year and the values taken by the synthetic (relative to the violent crime rates over the 2005–09 time period). The 95 percent confidence intervals are depicted as well. The dependent variable is the number of reported violent crimes each month in the county. The specifications include an indicator variable for being the synthetic or actual county, along with 15-year fixed effects. The dataset used pools the actual county and the constructed, synthetic county over the years 2005 to 2020; $N=384$. Data from FBI Uniform Crime Reports.

Table 3: Estimated Average Treatment Effects: Property Crime

	St. Louis County (1)	City of St. Louis (2)	Jackson County (Kansas City) (3)	Greene County (Springfield) (4)	Boone County (Columbia) (5)
Actual county x Post	80.25 (87.55)	-340.41 (247.16)	-209.31 (520.60)	82.30** (38.08)	155.05*** (16.89)
R ²	0.39	0.18	0.11	0.27	0.83
Dependent variable mean	2184.82	1958.46	2753.06	1246.0	2753.06

Results from a difference-in-difference specification. The data pools the actual city and its synthetic over the 2005–20 time period using the number of violent crimes per 100,000 population as the dependent variable; $N = 384$. An indicator variable for being an actual or synthetic observation is included along with a post-treatment indicator variable. The final row provides the dependent variable's mean for the pre-treatment periods (2005–14). Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance. Data from FBI Uniform Crime Reports.

particular crime results in an arrest, if there is a systematic drop in the clearance rate for the full volume of crimes committed, then this may be an indication that law enforcement is under-resourced.

Table 4 focuses on property crime, which was previously shown to be flat for St. Louis, Kansas City, and Springfield but has been a growing problem in Columbia. Table 4 specifically replicates the work presented in Table 3 but uses the clearance rate as the outcome variable rather than the total property crime observed.

4.4.1: Property Crime in Columbia

Figure 6 replicates the same analysis produced in Figure 5, but focuses on property crimes instead to identify the temporal pattern. Interestingly, the jump in Columbia's property crime occurs around 2011. This is earlier than what was observed for violent crime in St. Louis and Kansas City. If we re-estimate the final column of Table 3 but use 2011 as the break in the data, the average treatment effect grows substantially. Property crime is almost 7% greater for the 2011–19 time period than it would have been if Columbia had followed the trends of its synthetic peer. Thus, again, Columbia has a different experience than the other Missouri cities.

4.4.2: Property Crime's Clearance Rate

To what degree do resources allocated to law enforcement correlate with the observed changes in crime's prevalence?

First, we consider clearance rate. The clearance rate is the proportion of reported crimes that result in an arrest. While a number of factors will influence whether a

The only Missouri location that observed a statistically significant change in clearance rates is Boone County, which saw an 8.9 percentage point reduction in the clearance rate of crimes. That result may be surprising to residents of the City of St. Louis, so it is worth reminding readers that the clearance rate here measures crimes that result in an arrest. The substantial problems with criminal prosecutions and convictions during Kim Gardner's term as circuit attorney—including having 2,735 cases dismissed by judges for failure to prosecute¹³—are not included in this measurement.

As was depicted in Figure 6 for total property crime, we evaluate the event study exploring the change in property crime's clearance rate for Boone County in Figure 7.

Previously, we documented an increase in property crime

¹³ Spectrum Local News / Greg Palermo. Missouri AG releases recommendations, findings in Kim Gardner investigation. 14 November 2023. <https://spectrumlocalnews.com/mo/st-louis/news/2023/11/14/kim-gardner-report-released#:~:text=One%20judge%20said%20so%20many,Gardner's%20tenure%20as%20Circuit%20Attorney%22.>

around 2011. Figure 7 reveals that there is a corresponding change in policing effectiveness. The proportion of reported property crimes that resulted in an arrest decreased substantially after 2010.

4.4.3: Police Staffing

Changes in the clearance rate of property crimes may be driven by law enforcement resources. Consequently, we collect information on the number of law enforcement officials employed by agencies within each jurisdiction studied. Figure 8 graphically depicts the staffing levels over time.

The top panel depicts the total number of law enforcement officials in each county each year. The bottom panel normalizes this by the population size depicting the number of officers per 100,000 residents. Thus, while St. Louis has substantially more officers employed, staffing relative to population size is more moderate. Obviously, given its relatively

Figure 6

Escalating Property Crime in Columbia

Apart from a brief respite in 2013–2016, property crime rates in Columbia have been increasing steadily since 2010.

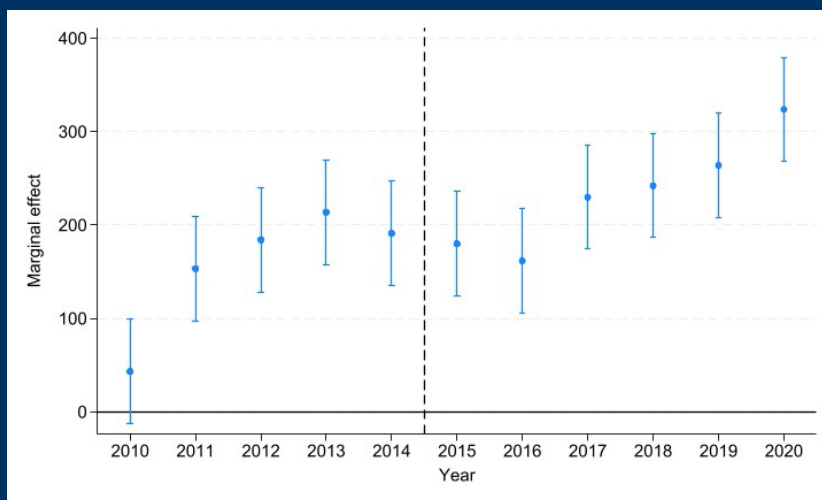


Figure 6 plots the estimated gap between the property crime rate observed in each year and the values taken by the synthetic (relative to the property crime rates over the 2005–09 time period). The 95 percent confidence intervals are depicted as well. The dependent variable is the number of reported property crimes each month in the county. The specifications include an indicator variable for being the synthetic or actual county, along with 15-year fixed effects. The dataset used pools the actual county and the constructed, synthetic county over the years 2005–2020; $N = 384$. Data from FBI Uniform Crime Reports.

Table 4: Property Crime Clearance Rate

	St. Louis County (1)	City of St. Louis (2)	Jackson County (Kansas City) (3)	Greene County (Springfield) (4)	Boone County (Columbia) (5)
Actual county x Post	-0.017* (0.009)	-0.013 (0.008)	0.011 (0.008)	0.119 (0.018)	-0.089*** (0.009)
R^2	0.11	0.51	0.27	0.12	0.33
Dependent variable mean	0.458	0.531	0.217	0.539	0.560

Results from a difference-in-difference specification. The data pool the actual city and its synthetic over the 2005–20 time period using the clearance rate for property crimes as the dependent variable; $N = 384$. An indicator variable for being an actual or synthetic observation is included along with a post-treatment indicator variable. Standard errors are presented in parentheses; *** 1%, ** 5%, * 10% level of significance. Data from FBI Uniform Crime Reports.

Figure 7 Clearing Crimes in Columbia

Clearance rates decreased steadily from 2008 to 2014.

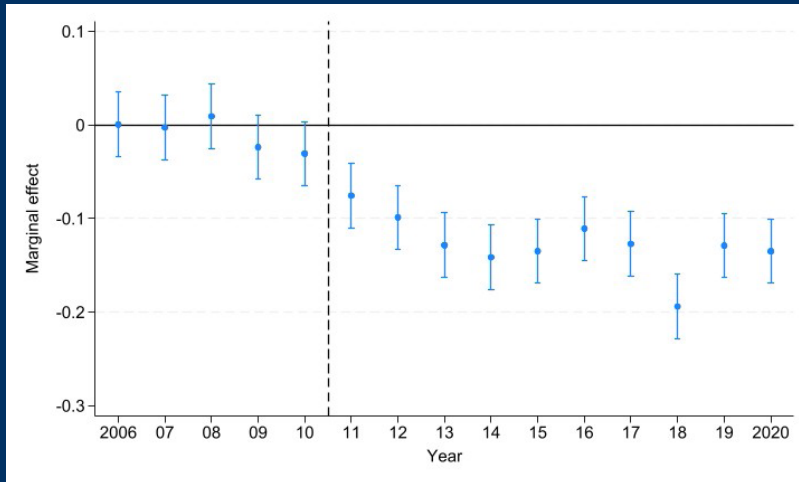


Figure 7 plots the estimated gap between the property crime clearance rate observed in each year and the values taken by the synthetic (relative to the clearance rates over the 2005–09 time period). The 95 percent confidence intervals are depicted as well. The dependent variable is the clearance rate each month in the county. The specifications include an indicator variable for being the synthetic or actual county, along with 15-year fixed effects. The dataset used pools the actual county and the constructed, synthetic county over the years 2005 to 2020; $N = 384$. Data from FBI Uniform Crime Reports.

smaller size, Boone County has a lower overall staffing level, but the number of officers per capita is also low relative to the other locations studied. The vertical dashed lines in each figure depict the two time breaks previously identified. Interestingly, employment prior to 2019 was quite stable in all four jurisdictions. There do not seem to be changes in staffing that coincide with observed breaks in the crime rate identified in 2011 (for property crime in Columbia) and 2015 (for violent crime and murders in St. Louis and Kansas City).

Importantly, staffing does not seem responsive to the volume of crime. To illustrate this further, Figure 9 depicts the number of property crimes and violent crimes arising in a year divided by the number of law enforcement officials employed for that year.

A story emerges. Crime has been rising, but staffing has been flat. Hence, the number of property crimes per officer and the number of violent crimes per officer has been steadily increasing.

4.5: Conclusion and Summary of Findings

Rising crime, especially violent crime, has brought considerable harm to cities in Missouri. Violent crime threatens individual safety, which especially harms the vitality of urban areas. Property crime not only imposes costs on people, but also harms the economic well-being of cities.

This report details the extent to which cities throughout Missouri experienced increases in their crime rates beyond what would have been expected in cities that followed the national trends in crime rates. This growth suggests that policymakers should be responding.

This report examines the trajectory of crime across cities in Missouri over the past 20 years. An analytical approach—the synthetic control method—is

employed to determine a suitable counterfactual city that is compared to the actual Missouri city. This approach is used to determine the trajectory of crime that Missouri cities would have followed (i.e., the crime trajectory across the United States) if the policies, practices, and specific events that occurred in Missouri had not impacted criminal behavior in these cities. The jurisdictions making up the synthetic are affected by all policies arising across the country (including crime-detering efforts) but are unaffected by Missouri's policies. The difference between the crime rate in Missouri's cities and their synthetics, then, captures the impact of Missouri's policies.

A few main points emerge from the analysis. First, the homicide rate in Missouri cities has significantly increased

¹³ Due to data limitations in this complementary dataset, only Eugene, Oregon, is available. Thus Columbia's synthetic unit is exclusively Eugene, Oregon.

¹⁴ Again, the level of spending observed each year is divided by the level of spending observed in that city in 1977. The result of the normalization lets us look at the growth rate in the budget over time.

relative to similar-looking cities in other parts of the country. Indeed, the City of St. Louis, St. Louis County, and Jackson County saw significant increases in homicide rates—as large as 230%—starting in 2015.

Second, the violent crime rate is examined. St. Louis, Jackson, and Greene counties experienced significant increases in the violent crime rate. These increases in violent crime and homicide rates are in lockstep with the death of Michael Brown. Given the significant protesting and pushback against law enforcement during this time, the analysis then examines shifts in policing behavior. Specifically, an examination of the amount of law enforcement personnel and the change in clearance rates at the time that violent crime and homicide rates increased is conducted. While law enforcement personnel levels have remained stable over time, clearance rates have declined, which is likely caused by police staffing levels being outpaced by crime increases.

Third, we also explore property crimes in Missouri's cities. While the property crime trends in St. Louis, Springfield, and Kansas City for the most part match the time trend of their peers, Columbia experiences an escalation in property crimes. This effect coincides with reductions in spending on law enforcement and law enforcement staffing relative to its peers.

Figure 8 Number of Law Enforcement Officers

There is no obvious connection between staffing levels and either Columbia's increase in property crime from 2011 or the increases in violent crime in St. Louis and Kansas City from 2015.

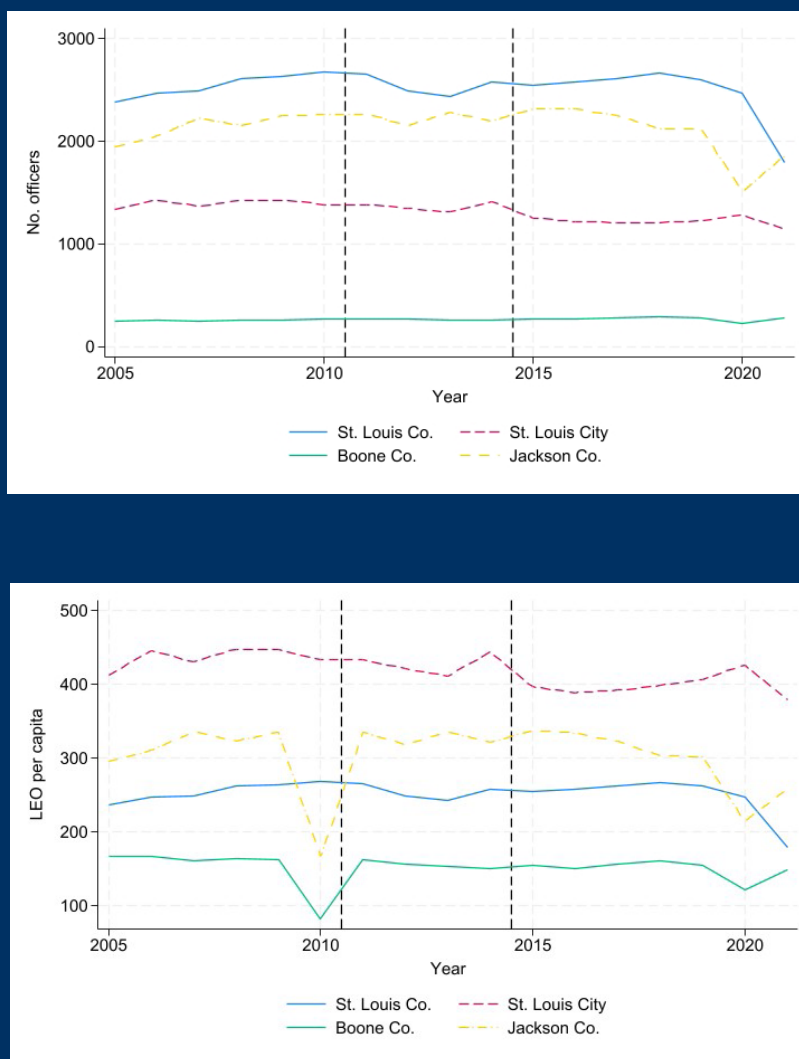


Figure 8 plots the number of law enforcement officials employed each year over the 2005–2020 time period. The top panel depicts the actual number, and the bottom panel normalizes by the population size (i.e., officers per 100,000 residents). Data from FBI Uniform Crime Reports.

Figure 9

Crimes per Law-Enforcement Officer Employed

Staffing levels have not increased as levels of crime have gone up.

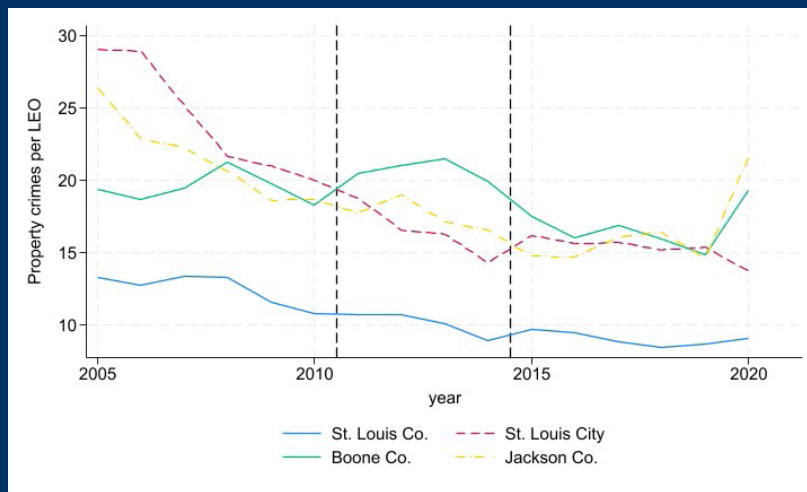
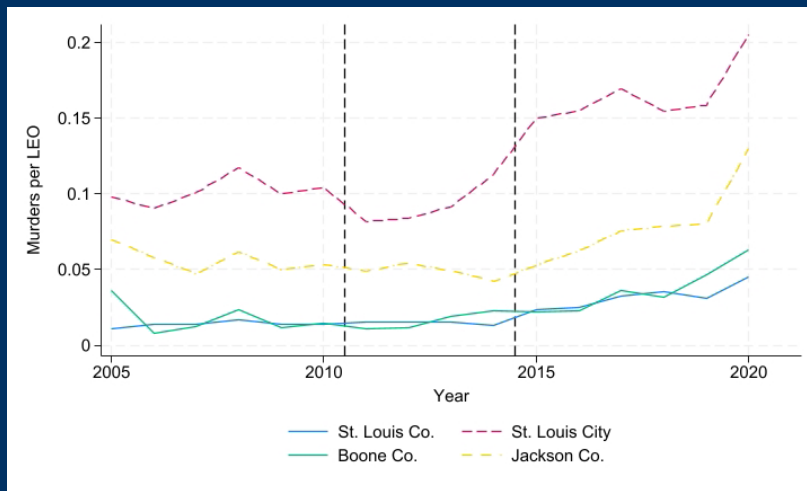


Figure 9 plots the number of violent crimes (top panel) and property crimes (bottom panel) per law enforcement official employed each year over the 2005 to 2020 time period. Data from FBI Uniform Crime Reports.

SECTION 5: POTENTIAL POLICY RECOMMENDATIONS

A natural extension of this work is to connect the empirical findings to potential policy modifications pertaining to the criminal justice system.

First, regarding violent crime, it is unlikely that the adoption of progressive prosecution and the failure to slow the escalation in crime are a coincidence. Progressive prosecution is, in essence, a bag of policies that reduce harshness and certainty of punishment in an effort to achieve other equity-related objectives. These policies may have been intended as a kinder approach to reducing incentives for criminal behavior, but at present there is little evidence that they have been effective. The progressive prosecutor's platform encompasses a wide spectrum of policies. These include the elimination of cash bail, decriminalization of lower-level offenses, diversion, and deferred prosecution, to name a few. With the data currently available, it is hard to identify which policies being adopted by prosecution leadership contribute the most to the escalation of crime. To do this would require extensive data on the timing of policy adoptions, the breadth and depth of those adoptions, and a clear accounting of the circumstances in which they are applied. Partnership with prosecutor offices scientifically assessing the impact of policy going forward could produce important knowledge about the tradeoffs associated with these interventions.

For an illustration, one policy commonly appearing as part of the progressive prosecution platform is diversion programs. Targeted at first-time offenders, diversion looks for alternatives to a felony conviction. The first conviction imposes a significant cost; it not only triggers negative stigma from peers and the community but also creates collateral consequences such as lost access to employment. Repeat offenders have already experienced these losses. In recent research by Mueller-Smith and Schnepel (2021), studying Harris County, Texas, the introduction of a diversion program led to reduced re-offending rates. The authors argue that it avoided the negative stigma that would have accompanied a felony conviction, thereby keeping the costs of re-offending high. Other policies, such as the elimination of zero cash bail, have basically been unstudied even though they have been implemented in jurisdictions across the country.¹⁵

Second, with escalated violent crimes per law enforcement official employed, another reasonable policy suggestion is to improve staffing. Our analysis uses aggregated information, such as the total number of law enforcement officers employed. Revisiting budgeting decisions and officer allocation decisions may help to slow the growth in both property and violent crime. The analysis in this report reveals that staffing levels have been relatively flat, while both total population and total crime have increased. Police staffing should mirror the level of crime within the city.

Third, in addition to prosecution data, it could be fruitful to conduct an analysis on the effect of incarceration on criminal conduct in Missouri's cities. To do so would require information about the punishment associated with guilty dispositions, as well as the length of sentences imposed. The aggregate crime data available from the FBI do not provide enough information on the background and experiences of the individuals committing those crimes. Because a large volume of crime is committed by a relatively small number of individuals, targeted policies may be effective. Without detailed information, though, analysis to construct specific policy proposals is challenging.

A centralized repository of prosecution data, similar to the FBI's Uniform Crime Reports, that contained referred cases, filed charges, and dispositions of cases would greatly increase what can be learned from conducting analyses like

those in this report. Legislation that would create such a repository has been considered and enacted in other states. For example, the California Legislature has proposed the Justice Data Accountability and Transparency Act.¹⁶ Such a repository would allow for improved information on case-handling decisions, localized crime surge responses, pretrial detention, deferred prosecution, and other information about decisions made by prosecutors. In an institutional setting with head prosecutors selected by popular election, improved public information should enhance the public's ability to hold local elected officials accountable for the decisions they make.

Fourth, local reforms at the city and municipal levels could build upon or undermine statewide reforms. The adjacent jurisdictions of the City of St. Louis and St. Louis County experienced different trends during the period immediately after the City of St. Louis passed sweeping reforms that created alternatives to criminal sanctioning, when St. Louis County had yet to do so. Hence, proactive local leaders can meaningfully affect these adverse trends.

APPENDIX

To identify a donor pool, the process starts with a list of all U.S. cities with populations over 150,000 (as of the 2020 Census). The county associated with each city is then identified. Hence, counties are used as the unit of observation. Monthly law enforcement agency level crime data from the FBI's Uniform Crime Report are then collected. These data are aggregated to determine the primary county Federal Information Processing Standard (FIPS) codes in which they operate. The focus of this analysis is on crimes arising over the period from 2005 to 2020.

The predictor variables include several annual, county-level variables provided by the U.S. Census in the American Community Survey. The predictor variables used are:

- County's population
- Percentage of the population below the age of 18
- Percentage of the population over the age of 65
- Percentage of the county's population living below the poverty line
- Median household income
- Percentage Black
- Percentage female
- Percentage with at least a high-school degree
- County unemployment rate
- County labor force participation rate

Additionally, the property crimes, violent crimes, and homicides (all measured as the number per 100,000 population) are used in the construction of the synthetic unit. Counties for which the American Community Survey does not consistently provide data over the entire 2005–2020 time period are removed from the analytical dataset. With these data-driven omissions, the restriction to counties with cities over 150,000 residents, and the recognition that some counties contain multiple cities with large populations (such as Clark County, Nevada), a donor pool of 118 counties is generated for our three units of primary interest.

In the construction of the synthetic units, the predictor variables between the actual and synthetic units are matched over an early time period. In our analysis, we do not start with a known time period at which the divergence caused by policy occurs. Thus, we select an early time period to end the matching process. We choose to match over the 2005 to 2010 time period. This gives us five years' worth of annual data to use in the matching process. It is common practice to end the matching process prior to the treatment date as it ensures that any anticipation effects do not affect the construction of the synthetic. Each predictor variable is equally weighted and is used in each pre-treatment period. Our analysis reveals that the break in the data between the actual counties and the synthetics occurs in 2015. Thus, the synthetics are constructed before the policy changes that could be causing this divergence were instituted.

The results of the three constructions led to the communities shown in Table 5 being used in the composition of the synthetic units.

Table 5: Construction of the Synthetics

County	Major City	Weight
<i>City of St. Louis</i>		
Mobile County, AL	Mobile	0.667
Webb County, TX	Laredo	0.207
Caddo Parish, LA	Shreveport	0.115
Cameron County, TX	Brownsville	0.011
<i>St. Louis County</i>		
DuPage County, IL	Aurora	0.362
St. Lucie County, FL	St. Lucie	0.279
Guilford County, NC	Greensboro	0.149
San Diego County, CA	San Diego	0.147
Salt Lake County, UT	Salt Lake City	0.037
Fulton County, GA	Atlanta	0.021
Orange County, CA	Irvine	0.004
Summit County, OH	Akron	0.001
<i>Greene County</i>		
Placer, CA	Sacramento	0.059
St. Lucie, FL	St. Lucie	0.069
Dauphin, PA	Harrisburg	0.459
Potter, TX	Amarillo	0.152
Webb County, TX	Laredo	0.151
Lane County, OR	Eugene	0.109
<i>Boone County</i>		
Rutherford County, TN	Murfreesboro	0.322
Webb County, TX	Laredo	0.288
Potter County, TX	Amarillo	0.221
Arlington County, VA	Arlington	0.125
Lane County, OR	Eugene	0.044
<i>Jackson County</i>		
Alexandria County, VA	Alexandria	0.512
Pinellas County, FL	St. Petersburg	0.467
Cook County, IL	Chicago	0.021

Table 6: Quality of the Fit

	Donor Pool	City of St. Louis		St. Louis County		Jackson County		Boone County	
		Actual	Synthetic	Actual	Synthetic	Actual	Synthetic	Actual	Synthetic
Homicides (per 100,000)	6.95	11.31	3.19	2.99	2.29	9.66	2.71	0.37	0.78
Property crime (per 100,000)	3497.03	2440.62	1476.30	2445.63	1924.01	3608.81	1897.30	432.73	801.13
Violent crime (per 100,000)	556.77	563.49	167.60	266.13	247.39	627.70	320.01	54.79	95.94
Population	1,206,190	319,362	394,218	1,000,312	1,089,405	738,425	672,152	178,116	245,019
Prop. pop. younger than 18	0.228	0.192	0.251	0.222	0.223	0.098	0.162	0.201	0.266
Prop. pop. older than 65	0.147	0.145	0.157	0.178	0.171	0.176	0.180	0.114	0.117
Poverty	304.22	240.28	253.12	341.25	325.76	305.68	353.97	273.60	272.31
Prop. pop. Black	0.133	0.447	0.273	0.195	0.113	0.195	0.127	0.063	0.064
Prop. pop. with high school degree	0.686	0.684	0.618	0.722	0.706	796	0.780	0.758	0.611
Prop. pop. female	1.120	0.528	0.530	0.532	0.532	0.528	0.527	0.516	0.516
Unemployment	427.24	168.70	131.22	305.20	353.62	240.70	244.13	38.40	67.03
Labor force participation	4974.74	1387.00	1411.90	4451.10	4591.61	2962.80	3220.71	719.90	1009.71
Median household income	67,040	44,607	48,987	73,742	71,838	50,475	79,864	62,203	60,578

Each averages the values over the 2005–2014 time period. The Donor Pool column averages all counties not included in any synthetic across all pre-treatment years. The other columns average across the 120 pre-treatment months. Data from FBI Uniform Crime Reports.

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