# Gun Violence in Black and White: Evidence from Policy Reform in Missouri

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**Abstract**

The extent to which gun control policies contribute to the significant racial disparities in U.S. gun violence remains largely unexplored in the empirical gun control literature. On August 28, 2007 the Missouri General Assembly repealed an 86 year-old "permit-to-purchase" (PTP) law requiring that handgun purchasers possess a permit, and subsequently undergo a background check, for all sales. Using generalized synthetic control methodology, this paper examines the impact of the 2007 Missouri PTP repeal on city-level gun violence and enforcement activity across racial groups. Estimates suggest that the repeal led to exponential growth in statewide FBI handgun background checks among licensed dealers and a 24 percent increase in the fraction of suicides committed with a firearm (FSS) within the City of St. Louis and Jackson County. Within St. Louis and Kansas City, the repeal led to a 19 percent increase in Black firearm homicide and a 22 percent decrease in Black non-gun homicide primarily driven by weapon substitution among Black youth. The escalation in Black gun violence coincides with a 125 percent decrease in aggravated assault arrests and a 44 percent decrease in weapons arrests among Black suspects. While this study largely finds no evidence of significant changes in White homicide victimization and enforcement activity, law enforcement officers themselves experience an additional 2.33 gun assaults per 100 officers. The disproportionate shifts in gun violence, and declines in policing productivity, remain consistent with a preemption model in which strategic complementarities in violence contribute to disproportionate changes in homicide across racial groups as firearms become more readily available.

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## 1 Introduction

*"I think there's so much murder because of fear, a fear of the unknown, really. It's hard out here.... Better getting caught with [a gun] than without."*

- Black St. Louis Resident (Speri, 2015)

In the presence of a larger public discourse on criminal justice reform and policing, considerable racial disparities exist in homicide victimization. Homicide alone contributes nearly a full year to the 4.7 year gap in life expectancy between Black and White U.S. males (Kochanek et al., 2013). While constituting less than 13 percent of the population, Black Americans account for roughly half of all homicide victimization and known offending–with more than 50 percent of these homicides involving guns (Cooper and Smith, 2011). The salient role of firearms in Black homicide victimization are in stark contrast to most household survey evidence with Black households reporting very low gun ownership rates when compared to all other groups (Parker et al., 2017). Differences in self-reported gun ownership and homicide outcomes suggests that understanding underground markets, and the gun control policies responsible for addressing them, remains critical to addressing these disparities.

The state of Missouri serves as an interesting setting to examine the relationship between race and gun control policies given the considerable disparities in homicide and recent policy reforms related to the regulation of private gun sales (Cook, 1991; Sherman and Rogan, 1995; Rosenfeld and Decker, 1996; Blumstein and Rosenfeld, 1998). On August 28, 2007 the Missouri General Assembly repealed an 86 year-old "permit-to-purchase" (PTP) law requiring that handgun purchasers possess a permit, and subsequently undergo a background check, for all sales.[1] Under

[1]The 1993 Brady Handgun Violence Prevention Act set a federal mandate requiring background checks for all federal firearms license (FFL) sales (e.g., sales within gun stores) and left regulation of private firearm sales to states. According to the Bureau of Justice Statistics (BJS) 2005 Survey of State Procedures Related to Firearm Sales, only 16 states required some form of background check or licensing for private firearm sales with 34 states essentially leaving private firearm sales unregulated.

the former law, individuals wishing to purchase a handgun were required to apply for a permit for all firearm sales (i.e., licensed and unlicensed). The permit application process included an extensive background check conducted by each local sheriff's office–including information unavailable in federal background checks such as civil proceedings and arrest records. The repeal of the 86 year old PTP law effectively removed any formal screening of private firearm sales within the state.

The PTP repeal coincides with important shifts in the racial dynamics of firearm homicide within Missouri. Figure 1 compares the racial trends in Missouri gun violence relative to the rest of the country while also offering some insight into the role of gun proliferation across racial groups. Figure 1a shows that pre-repeal non-Hispanic Black firearm homicide victimization in Missouri considerably outpaces gun violence among Black victims in the rest of the country and is several orders of magnitude greater than similar rates for White Americans–peaking at roughly 60 deaths per 100,000 during the historic crime wave leading into the early 1990's (Grogger and Willis, 2000; Levitt and Venkatesh, 2000; Fryer et al., 2013).[2] Black gun violence in Missouri diverges from national trends after the PTP repeal and reaches unprecedented levels of violence by 2015. White gun violence in Missouri is generally comparable to national trends for the majority of the study period, but overtakes the rest of the country by 2014.

In contrast to the historic levels of gun violence in the early 1990's, Figure 1b shows that gun proliferation appears to play a more salient role in post-repeal homicide victimization within Missouri. This figure specifically compares trends in the ratio of firearm to non-gun homicide deaths for Black and White Missourians. Black firearm homicide exceeds non-gun homicide in every year of the study period, but this ratio never surpasses five during the pre-intervention period. Immediately following the repeal, Black firearm homicide exceeds non-gun homicide by a factor of seven and rises to 10 after 2014. The corresponding ratio for White Missourians remains at parity

[2]This study exclusively focuses on non-Hispanic Black and White groups as Hispanic Missourians make up roughly four percent of the population, but account for less than three percent of all firearm homicide deaths over the pre-intervention period. All references to 'Black' and 'White' specifically speak to these groups unless otherwise stated in the text.

for the majority of the study period, but increases to three after 2014. Overall, Figure 1 shows that race plays a decisive role in Missouri homicide rates with gun proliferation more prominently featured during the post-repeal period.

This study examines the impact of the 2007 PTP repeal on gun violence and enforcement activity across racial groups over the 1981-2018 period. The analysis primarily focuses on changes in post-repeal gun violence through the experiences of the City of St. Louis and Kansas City, the two largest cities in the state, for two important reasons.[3] First, Kansas City and St. Louis account for nearly 80 percent of pre-repeal gun violence in the state. The concentration of crime within both cities also remains consistent with the experiences of other large cities in the country (Glaeser and Sacerdote, 1999; O'Flaherty and Sethi, 2010c). Both cities also account for 60 percent of crime gun recoveries in the state over the first seven years of the post-repeal period and reflects the strength of their underground gun markets relative to other parts of the state. A second reason involves an important distinction made by O'Flaherty and Sethi (2010a) where both cities remain comparable to "war zones" characterized by preemptive gun violence often driven by a "fear multiplier" effect. The extraordinary levels of concentrated gun violence are in stark contrast to the "peaceable kingdoms" elsewhere in the state for which murder remains largely autonomous and a rare event. Consistent with a growing literature highlighting the importance of social interactions in criminal behavior (Glaeser et al., 1996; Papachristos, 2009; O'Flaherty and Sethi, 2010a; Deming, 2011; Patacchini and Zenou, 2012, 2013; Billings et al., 2014, 2019), and directly relevant to this study, O'Flaherty and Sethi (2010b) argue that the preemptive motive to preserve one's life can lead to important strategic complementarities in violence which can account for the significant racial disparities in homicide–with factors such as higher segregation and the nature of offending costs contributing to these racial differences. To the extent that this behavior remains present in Kansas City and St. Louis, these models provide an explicit connection between race and gun control

[3]As an independent city, the City of St. Louis is administratively distinct from St. Louis County and all references to "St. Louis" focus on the former entity unless explicitly stated otherwise.

policies such as the PTP repeal.

Estimating the causal effects of the PTP repeal on gun violence requires the construction of suitable counterfactual trends for the treatment units. This study employs a data-driven approach to constructing these counterfactual trends using the generalized synthetic control methodology (GSC) introduced in Xu (2017). Building on the Abadie et al. (2010) synthetic control (SC) methodology and the interactive fixed effects model from Bai (2009), GSC estimation possesses several distinct empirical advantages in estimating the effects of the PTP repeal on gun violence across racial groups. First, GSC estimation allows for multiple treatment units which eases the computational burden of constructing individual synthetic trends for each treatment unit. Second, this approach also relaxes the non-negative weight assumption behind the synthetic control estimator and uses the full control group data in order to construct counterfactual trends–allowing for negative correlations between treatment and control units to factor into estimation. Third, Kansas City and St. Louis often rank among the top cities in the U.S. with respect to pre-intervention Black homicide victimization. When a treatment unit falls outside of the convex hull for the control units, the SC estimator will fail to construct suitable counterfactual trends. A fourth empirical advantage of GSC estimation involves the flexible inclusion of additive fixed effects accounting for important differences in factors such as criminal justice policies (e.g., local law enforcement characteristics) and common temporal shocks (e.g., the crack cocaine epidemic (Fryer et al., 2013) and changes in gun markets associated with the 2008 presidential election (Depetris-Chauvin, 2015)).

In the absence of administrative data on gun ownership, this study follows previous work in using two complementary proxy measures of gun ownership–namely the number of state-level *federal* background checks conducted by FFL dealers and county-level fraction of suicides committed with a firearm (FSS). While the former measure provides insight into changes in primary gun market activity after the repeal, county-level FSS describes shifts in local gun ownership and possesses a well-documented relationship to "illegal" gun proliferation in the literature (Cook, 1991; Duggan, 2001; Cook and Ludwig, 2004, 2006). The almost instantaneous surge in the demand for firearms in primary markets, and increasing number of recently purchased guns recovered from crime scenes, suggests that these markets serve as a critical source of firearms to underground markets. Using these measures, this study finds that the PTP repeal led to an additional 1,387 handgun background checks per 100,000 residents statewide, on average, or a two-fold increase relative to the pre-repeal period. This exponential growth in potential gun sales among FFL dealers remains exclusive to handguns and is consistent with the provisions of the former law. The PTP repeal also increased local gun ownership by 24 percent within the City of St. Louis and Jackson County–with the latter accounting for the vast majority Kansas City's residential population. When combined with descriptive evidence highlighting the large increase in crime gun recoveries within both cities, these findings remain consistent with previous work suggesting an intimate connection between primary and illegal gun markets (Levitt and Venkatesh, 2000; Cook et al., 2007, 2015).

The analysis then turns to the question of whether the post-repeal firearm supply shock coincides with city-level changes in homicide across racial groups. Consistent with predictions from the preemption model, the PTP repeal led to an additional 13.20 Black firearm deaths per 100,000 and a *decrease* of 3.76 Black non-gun deaths per 100,000, on average. A deeper examination of the evidence suggests that this weapon substitution effect takes place primarily among Black homicide victims ages 15-24 and confirms previous work suggesting that Black teens tend to carry firearms more in areas with higher levels of gun ownership (Cook and Ludwig, 2004). Point estimates for White homicide victimization generally show smaller (non-significant) increases in firearm homicide although dynamic firearm homicide effects suggest a significant increase over the last three years of the post-repeal period.

The escalation in post-repeal gun violence also presents important challenges to local law enforcement both in terms of maintaining public safety and as a direct threat to officers in the line of duty. Consistent with the evidence on post-repeal homicide victimization, this study finds that PTP repeal decreased Black aggravated assault arrests by 125 percent and Black weapons arrests by 44 percent with no statistically significant evidence for corresponding White arrest rates.

These declines in policing productivity take place during a period in which weapons possession offenses became increasingly difficult to prosecute due to a 2005 change in state laws allowing for open carry in motor vehicles in addition to reductions police force size in Kansas City and St. Louis induced by the Great Recession. Given the strong consensus within the policing literature regarding the importance of police force size to crime reduction (Levitt, 1997; Evans and Owens, 2007; Chalfin and McCrary, 2018; Mello, 2019; Weisburst, 2019; Chalfin et al., 2020), with no evidence of changes in murder arrests or clearance rates, these changes most likely contributed to the post-repeal declines in the policing productivity in Black neighborhoods by lowering the costs of gun investment and offending. Moreover, this study also finds that the PTP repeal exposed law enforcement to greater levels of gun violence with gun assaults by suspects increasing 75 percent despite decreasing trends in officer assaults by all other means. Thus, these findings suggest that the PTP repeal led to significant deterioration in public safety for civilians and officers alike.

Finally, this paper also estimates the consequences of the PTP repeal on race-specific homicide victimization across the respective distributions for Black and White neighborhoods in both cities using the nonlinear “changes-in-changes" estimator pioneered in Athey and Imbens (2006). With previous research highlighting the important role of neighborhoods in social interactions (Kling et al., 2005; Patacchini and Zenou, 2013; Chetty et al., 2020), these estimates provide important insight regarding the distributional consequences of the PTP repeal as posited by models of social interactions in homicide (O'Flaherty and Sethi, 2010b). Neighborhood-level changes-in-changes estimates confirm statistically significant increases in Black homicide victimization beyond the most violent neighborhoods in both cities with no significant changes in White homicide for any decile in its respective distribution. Altogether, this evidence suggests that Black victims in Kansas City and St. Louis were considerably more likely to encounter an offender who made a post-repeal investment in firearms when compared to White victims.

This study contributes to a larger literature examining the effects of gun control policies on gun proliferation and homicide often characterized by mixed evidence concerning their protective effects (Loftin et al., 1991; Britt et al., 1996; Ludwig and Cook, 2000; Duggan, 2001; Koper and Roth, 2002; Cook and Ludwig, 2006; Duggan et al., 2011; Leigh and Neill, 2010; Cheng and Hoekstra, 2013; Dube et al., 2013; Knight, 2013; Cook et al., 2014; Webster et al., 2014; McClellan and Tekin, 2017; Donohue et al., 2019). However, the manner in which these policies impact U.S. racial disparities in homicide remain largely unexplored in the empirical gun control literature.[4] This paper is the first to explicitly examine the nature in which gun control policies affect racial differences in homicide and enforcement activity. More importantly, the analysis suggests a direct connection between largely segregated gun violence and declines in policing productivity with respect to gun offending. This paper also provides stronger evidence showing that the PTP repeal led to increased exposure to gun violence by law enforcement compared to previous work (Crifasi et al., 2016). Focusing on the racial implications of gun control policy provides a new pathway for future research to evaluate similar interventions capable of producing meaningful effects within underground gun markets.

While the findings from this paper are consistent with the *state-level* results presented in Webster et al. (2014), this paper departs from their work in several critical ways. In contrast to their focus on the 1999-2013 period, the main analyses for this study include nearly 26 years of pre-repeal data and 12 years of post-repeal data–providing a more complete picture of pre-intervention trends and the sustainability of gun violence deeper into the post-repeal period. While Webster et al. (2014) primarily rely on vital statistics data, the usage of FBI Supplementary Homicide Reports (SHR) data in this analysis also allows for a more granular understanding of *city-level* homicide victimization (e.g., homicide by age, race/ethnicity, and weapon type). Second, GSC estimation provides a data-driven approach to constructing credible counterfactual trends and assessing the extent which parallel trends holds over the longer pre-intervention period. Third, this study also

[4] McClellan and Tekin (2017) exploit state-level variation in "stand your ground" laws in order to estimate their impact on homicide and injuries–with these effects generally concentrated among White men. While Missouri passed a similar law around the time of the repeal, stand your ground laws are not weapon-specific and their estimates run counter to the results presented in this paper. More importantly, their work does not necessarily explore why racial differences in homicide would result from this particular policy regime.

uses two complementary proxies of post-repeal gun proliferation in order to formally assess the impact of the repeal on gun supply to both primary and secondary gun markets. A fourth difference involves this study's focus on race which acknowledges a growing consensus on the role of social interactions in determining homicide and policing outcomes.[5] Finally, this study also documents the increase in officer exposure to post-repeal gun violence with a more convincing research design and highlights the additional social costs of gun market deregulation .

The paper proceeds in the following manner. Section 2 examines the racial differences in homicide trends within the City of St. Louis and Kansas City while also motivating the preemption model within the context of the Missouri PTP repeal. Section 3 describes both the GSC estimation strategy and the changes-in-changes model. Section 4 then goes on to discuss the primary data sources for the study and sample construction. Section 5 presents the GSC estimates corresponding to the gun proliferation, homicide, and enforcement activity results. Additional analyses also confirm the robustness of these results to alternative specifications, study samples, and estimation strategies. The paper then provides neighborhood-level changes-in-changes estimates capturing the distributional consequences of the PTP repeal across racial groups. Finally, the paper concludes in Section 6.

## 2 Race and Homicide within the St. Louis and Kansas City

Gun violence in St. Louis and Kansas City is overwhelmingly concentrated in predominately Black, and deeply segregated, neighborhoods. Figure 2 shows neighborhood-level (i.e., census tract) changes in firearm homicide across racial groups three full years before and after the 2007 PTP repeal while associating each neighborhood with their percentage of non-Hispanic Black residents according to the 2010 American Community Survey data . These homicide data come directly from the St. Louis and Kansas City police departments which are then mapped into each city's 2010

[5]Moreover, the inclusion of variables such as law enforcement officers per capita in the preferred specification in Webster et al. (2014) could also bias their estimates given the important changes in policing activity specific to Black communities.

census tract boundaries. One immediately notices the extraordinary levels of residential segregation across both cities. The well-known “Delmar (Boulevard) Divide" partitions the predominately Black neighborhoods in the north from the predominately White and more affluent neighborhoods in the southernmost neighborhoods in the City of St. Louis with Troost avenue playing a similar role in Kansas City. Black neighborhoods in both cities experience historically higher levels of poverty, unemployment, and educational attainment when compared White neighborhoods. These neighborhoods also account for nearly 90 percent of homicides over this period. Local police reports from both cities also suggest that the majority of reported circumstances tend to involve an argument or dispute with gang violence and drugs playing a more limited role with respect to homicide in both cities. Post-repeal increases in White homicide victimization are somewhat larger in Black neighborhoods when compared to White neighborhoods.

The intense spatial concentration of post-repeal gun violence significantly alters the incentives for investment in illegal firearms. As suggested in Figure 2, incidents with reported suspect information are largely intraracial with ‘Black-on-Black’ homicide increasing sharply during the first three years of the post-repeal period. These spatial patterns align with a growing economics of crime literature emphasizing the role of social interactions in shaping spatial and temporal variation in crime (Glaeser et al., 1996; Glaeser and Glendon, 1998; O’Flaherty and Sethi, 2010a,b; Patacchini and Zenou, 2012, 2013). In contrast to the autonomous decision-making discussed in the canonical (Becker, 1968) model, explanations based on social interactions acknowledge the interdependent nature of criminal decision-making in addition to the importance of contextual factors such as segregation in contact and attributes of the individuals involved that could ultimately lead to significant multiplier effects.

Relevant to this study, O’Flaherty and Sethi (2010b) provide a theoretical account for racial differences in homicide where the preemptive motive to preserve one’s life can lead to an escalation in violence as expectations surrounding it’s usage become self-fulfilling. Suppose that two randomly matched individuals, from observable groups $B$ or $W$, must settle a dispute. The probability a nonviolent individual is killed by a violent person is given by $p$ while one person dies when both are violent with probability $2q$ such that $q < p < 2q$. The commonly known loss to the victim is captured by $\delta > 0$ while (private) offending costs $\gamma \in \mathbb{R}$ have interaction specific distributions $F_{ij}(\gamma)\ \forall\ i, j \in \{B, W\}$. O'Flaherty and Sethi (2010b) show that each homicide interaction type represents a distinct Bayesian game with equilibrium probabilities of violence $\lambda_{ij} = F_{ij}(\tilde{\gamma}_{ij})$ and $\lambda_{ji} = F_{ji}(\tilde{\gamma}_{ji})$ with $(\tilde{\gamma}_{ij}, \tilde{\gamma}_{ji}) \in [0, \delta]^2$. Furthermore, the equilibrium per capita victimization rates $\forall\ i, j \in B, W$ are given by:

$$v_b = (\eta + (1-\eta)\beta)v_{bb} + (1-\eta)(1-\beta)v_{bw} \tag{1}$$

$$v_w = (\eta + (1-\eta)(1-\beta))v_{ww} + (1-\eta)\beta v_{wb} \tag{2}$$

where $\beta$ denotes the proportion of the population belonging to group $B$, $\eta$ the probability of drawing an own-group opponent (i.e., the nature of segregation), and $v_{ij} = \lambda_{ji}(\lambda_{ij}q + (1-\lambda_{ij})p)$ describing the likelihood of an individual from group $i$ being killed by someone from group $j$. In addition to placing some structure on the racial differences in homicide described in this study, the model yields sharp predictions based on whether offending costs $\gamma$ are victim-contingent (e.g., lower rates of conviction for cases involving Black victims) or offender-contingent (e.g., lower opportunity costs for Black offenders with extensive criminal records). While one could make a case for $\gamma$ being driven by both victim and offender attributes, offender-contingent costs remain consistent with the post-repeal experiences of both cities–including significant racial disparities in socioeconomic disadvantage, highly disproportionate number of known suspects with criminal histories (Hayden Jr, 2017), and well-documented concerns of witness cooperation (MODPS, 2019). In this case, an increase in segregation measure $\eta$ results in higher Black homicide victimization rates and lower White rates while an increase in $\beta$ raises homicide victimization for both racial groups. As shown in Figure 2, these predictions are very much consistent with the residential and homicide experiences in both cities where descriptive evidence also suggests $v_{wb} > v_{bw}$.

An extension of the preemption model allows for weapon acquisition, in which individuals can now make a costly ex-ante (binary) investment in technology that reduces offending costs, yields deeply insightful theoretical predictions for racial disparities in homicide. For example, the investment in new firearms may increase the lethality of a homicidal interaction if this weaponry possesses a greater capacity to fire more frequently and could even contribute to the anonymity of the incident when shooting from a distance (O'Flaherty and Sethi, 2010a). In the case of the PTP repeal, this characterization of the model most likely speaks to a decline in $c$ for new weapons driven by lower straw purchasing costs and increased competition in generally "thin" underground gun markets (Levitt and Venkatesh, 2000; Cook et al., 2007, 2015). If $F_{ib}(\gamma) \geq F_{iw}(\gamma)$, and for lower investment costs $c' < c$, O'Flaherty and Sethi (2010b) show show that policy interventions such as the PTP repeal would lead to a critical amplification effect–where $v_b^{'} > v_b$ and $v_w^{'} \geq v_w$, $v_b^{'} > v_w^{'}$. This amplification effect comes from the fact that a reduction in firearm investments costs results in a significant expansion in the range of types with sufficiently low $\gamma$ for $B$s relative to $W$s. In other words, Black residents in Kansas City and St. Louis are considerably more likely to encounter someone who has invested in a firearm than White Missourians in these cities. With previous research emphasizing the hyper-concentration of gun violence in many U.S. cities (Braga et al., 2010), one empirical implication of this finding is that post-repeal gun violence should extend beyond the most violent neighborhoods in both cities. This paper formally explores many of the predictions from the preemption model in the analyses to follow.

## 3 Empirical Strategy

### 3.1 Generalized Synthetic Control Estimation

This study estimates the effects of the PTP repeal on both gun proliferation and racial differences in gun violence using the generalized synthetic control (GSC) methodology introduced in (Xu, 2017). More specifically, the analysis primarily estimates linear factor models of the following form:

$$Y_{ct}^{j} = \beta_{ct}^{j} PTP_{ct} + \mathbf{X}'\gamma + \lambda_c' f_t + \alpha_c + \xi_t + \varepsilon_{ct}^{j} \tag{3}$$

where $Y_{ct}^{j}$ denotes an outcome among individuals of race $j$ for city $c$ (county or state for the gun proliferation results) at time $t$, $PTP_{ct}$ is a binary indicator of the permit-to-purchase law implementation, $\mathbf{X}$ a $k \times 1$ vector of stylized covariates, $f_t$ a $r \times 1$vector of unobserved common factors, $\lambda_c$ a $r \times 1$vector of unknown factor loadings, city (county or state) fixed effects $\alpha_c$, year fixed effects $\xi_t$, and unobserved idiosyncratic shocks $\varepsilon_{ct}^{j}$ with zero mean. Here, $r$ denotes the number of (a priori) unknown factors. Each city-level model controls for percent of the population male, racial composition for group $j$ (e.g., non-Hispanic Black models include percent of the population non-Hispanic Black and percent of the population Hispanic), percent of female-headed household, percent of the population living in (race-specific) poverty, (race-specific) unemployment rates, percent of the population never married, percent of the population with educational attainment less than high school, per capita income, percent of the population ages 15-24, percent of the population ages 25-44, and a (race-specific) isolation index measure accounting for city-level segregation.[6] Let $Y_{ct}^{j}(1)$ and $Y_{ct}^{j}(0)$ denote potential outcomes under a given gun control policy regime with pre-repeal periods $T_0$ such that $1 \leq T_0 \leq T$. The dynamic average treatment effect on the treated (ATT) units $c$ at time $t > T_0$ is given by:

$$\beta_t^{j} = \frac{1}{N_{Treated}} \sum_{c} [Y_{ct}^{j}(1) - Y_{ct}^{j}(0)] \tag{4}$$

Obtaining a causal estimate for $\beta_t^{j}$ requires finding a credible counterfactual for unobserved $Y_{ct}(0)$. GSC estimation tackles this issue by first estimating an interactive fixed effects model based on the full control group data in order to obtain estimates for $\hat{\gamma}$, $\hat{F}$, and $\hat{\lambda}_{CO}$. The next step involves finding factor loadings $\lambda_c$ that minimizes any pretreatment differences in the mean squared prediction

[6]All base models for the total population include percent of the population Black and the isolation index measure for Black residents. County-level and state-level gun proliferation models are not race-specific and only differ from the city-level specifications due to the lack of isolation index measures for these geographical levels.

error (MSPE) for each treatment unit. These estimates subsequently allow for the computation of $\hat{Y}^j_{ct}(0) = \mathbf{X}'\hat{\gamma} + \hat{\lambda}'_c \hat{f}_t$.

In order to estimate the (a priori) unknown factors $r$, GSC estimation utilizes a “leave-one-out" cross-validation procedure by holding back a small amount of pre-intervention data and uses the remaining data to predict the withheld data. This procedure uses average prediction accuracy in order to choose the optimal number of factors for the model. In contrast to the permutation tests associated with the SC methology, GSC estimation also contains a parametric bootstrap procedure for the estimation of standard errors. This bootstrap procedure also leverages the full set of control group data with draws based on the empirical distribution of prediction errors. Standard errors for each model in this study are based on bootstrap samples of $N = 2,000$.

Identification based on the exogeneity of the PTP repeal mainly rests on the familiar parallel trends assumption in addition to ruling out important anticipatory effects and interference among control units. While a direct test of the parallel trends assumption remains implausible, synthetic control methodologies remain helpful in understanding significant departures in pre-intervention gun violence trends between the treatment and estimated counterfactual trends (Abadie et al., 2010; Xu, 2017; Abadie, 2019). Restricting the donor pool to units with comparable pre-intervention characteristics, and removing units with large idiosyncratic shocks to the outcomes of interest, also helps in avoiding potential interpolation biases (Abadie et al., 2010; Abadie, 2019). Direct testing for anticipatory effects also remain challenging, but anecdotal evidence suggests that that general support for stricter gun control policies in cities runs in stark contrast to the widespread support for less restrictive gun laws in rural areas of the state–implying a potential divide in anticipated policy awareness (Edsall, 1999). Lastly, the no-interference assumption requires the absence of spillover effects in interstate gun markets. For example, a large gun supply shock to Missouri’s domestic secondary markets could lead to the state becoming a net exporter of firearms to markets in bordering states with more restrictive gun control policies (Knight, 2013). However, ATF gun trace data suggests that the post-repeal proliferation of crime guns overwhelmingly took place within Missouri's state borders.[7]

### 3.2 Changes-in-Changes Estimation

An important prediction from the preemption model involves the greater exposure of Black victims to gun investment in homicidal interactions taking place within Kansas City and St. Louis. Such an amplification effect possesses important distributional consequences for race-specific homicide in post-repeal Black and White neighborhoods. In particular, an escalation in post-repeal Black homicide should extend beyond the most violent neighborhoods in both cities with only a modest increase among the most violent White neighborhoods. In order to formally assess these predictions, this study also provides neighborhood-level (nonlinear) "changes-in-changes" estimates as put forth in Athey and Imbens (2006) and focuses on race-specific homicide.[8] Rather than focusing on the average effect of the treatment, the *distributional effect* serves as the estimand of interest as the impact of the treatment could vary across units (i.e., neighborhoods). Suppose for a collection of neighborhoods $i$ we observe $Y_{PTP=0|1i}(0)$ and $Y_{PTP=1|1i}(0)$ in pre-repeal period $t = 1$ for both groups. We also observe $Y_{PTP=0|2i}(1)$ and are interested in unobserved $Y_{PTP=1|2i}(0)$ in post-repeal $t = 2$. Let $F_{PTP|t}(\cdot)$ denote the cumulative distribution function corresponding to each potential outcome. Athey and Imbens (2006) show that the changes-in-changes estimator at quantile $\tau$ is then given by:

$$\Delta_\tau = F^{-1}_{PTP=1|2}(\tau) - F_{PTP=1|1}(F^{-1}_{PTP=0|1}(F_{PTP=0|2}(\tau))) \equiv \Pr(Y_{PTP=1|2i}(0) \leq \tau) \tag{5}$$

The first identifying assumption in estimating $\Delta_\tau$ involves being able to express the potential outcome in the absence of the treatment as a monotone function of unobservable $U_i$ and time such

[7] See the supplementary appendix for additional details. While Missouri accounts for less than one third of its total firearm traces in the year before the PTP repeal, this number increases to 50.34 percent by 2013. This large increase in the domestic recovery of Missouri firearms suggests that the PTP repeal had important consequences for illegal secondary markets within the state. Moreover, none of the states bordering Missouri experience any significant changes in Missouri firearm traces within their borders over the post-repeal period.

[8] In particular, the analysis estimates Black (White) homicide in predominately Black (White) neighborhoods based on their residential population in 2004.

that $Y_{PTP|ti}(0) = h(U_i, t)$–where $h$ is strictly increasing and the distribution of $U_i$ remains stable over time for both groups (i.e., rank similarity). Second, identification also requires that the support of $U_i$ for the treatment group be contained within the support of $U_i$ for the control group. Athey and Imbens (2006) also offer a residualized approach in order to control for a vector of covariates. This two-step process involves first recovering the residuals from a linear regression of the outcome on all covariates plus group time dummies then carrying out changes-in-changes estimation based on these residuals. This analysis specifically controls for poverty, unemployment, per capita income, percent of female-headed households, percent of residents with educational attainment less than high school, percent non-Hispanic, percent Hispanic, percentage of residents ages 15-24, and the percentage of residents ages 25-44. The underlying homicide data come from the City of St. Louis, Kansas City, and Cleveland (Ohio) police departments with additional information on these data in sections to follow.

## 4 Data

### 4.1 City-Level Homicide and Enforcement Activity

The main generalized synthetic control estimates for race-specific homicide and enforcement activity are based on several data sources covering a total of 143 large U.S. cities over the 1981-2018 study period. With the PTP repeal implemented in August 2007, this yields approximately 26 years of pre-repeal data and 12 years of post-repeal data. The primary source of homicide data come from the incident-level Supplementary Homicide Reports (SHR) which consist of *preliminary* reports to the FBI by local law enforcement agencies–with all analyses excluding officer-involved homicides, institutional killings, and incidents involving legal intervention by a private citizen.[9] The SHR data provide available information on both the victims and offenders involved in each homicide incident. Homicide incidents are aggregated up to the city-level separately by race/ethnicity, in

[9]The study sample also excludes homicide incidents related to the 1995 Oklahoma City bombing and the September 11, 2001 terrorist attacks.

addition to other characteristics of interest (e.g., age and weapon type), in order to construct all homicide rates per 100,000. Data on arrests and clearance rates come from the FBI Uniform Crime Reports (UCR).[10] Race-specific arrests categories cover a wide range of offenses from aggravated assault to weapons possession and all rates are again reported per 100,000 city residents. Although unavailable by race, clearance rates cover a range of index crimes with rates also disaggregated by weapon type for aggravated assault and robbery (i.e., gun, knife, unarmed, and other weaponry). Similarly, data on officer assaults by suspects come from the Law Enforcement Officers Killed and Assaulted (LEOKA) Program series and breaks these assaults out by weapon type with rates reported per 100 full-time sworn officers (i.e., total, gun, knife, unarmed, and other weaponry).

This study also interpolates demographic data from the U.S. Census Bureau across intercensal years with accompanying 2010-2018 data coming from the American Community Survey (ACS). Stylized covariates based on these data include information on the racial composition of the population (i.e, percent of the population non-Hispanic Black, non-Hispanic White, and Hispanic), percent of the population ages 15-24, percentage ages 25-44, percent of the population male, percent of residents ages 25 and over with educational attainment less than high school, percent of female-headed households, percent of the population who never married, (race-specific) unemployment rates, (race-specific) poverty rates, and per capita income (measured in 2000 dollars). Given the importance of residential segregation in determining the racial composition of homicidal interactions, this study also uses city-level isolation index data produced by the Census Bureau and made available by the Brown University American Communities Project (Logan, 2020).

In order to avoid potential contamination of the donor pool, this analysis excludes Indiana and Tennessee as each state repealed some form of background check requirement during the pre-intervention period.[11] In order to avoid interpolation biases, sample construction involves

[10] While FBI UCR arrest data only account for race and not ethnicity, the relatively small Hispanic population in both cities results in very minor differences between these measures.

[11] One exception remains the 2012 repeal of the “one-handgun-per-month" law repeal in Virginia. However, private handgun sales in Virginia do not require background checks.

the removal of potential control units within the donor pool experiencing large (non-systematic) idiosyncratic shocks during the pre-intervention period. In a similar vein, this study also restricts the sample to cities with a total population of at least 50,000 residents in 2000, 10,000 non-Hispanic Black residents in 2000, and complete data over the study period which ultimately yields a sample of 143 large U.S. cities.[12]

### 4.2 Gun Proliferation

GSC estimation of the PTP repeal's impact on gun market activity involve two distinct measures of gun proliferation. The county-level fraction of suicides committed with a firearm (FSS) serves as the first proxy measure and enjoys considerable support in the literature as a measure of local gun ownership (Cook, 1991; Duggan, 2001; Cook and Ludwig, 2004, 2006).[13] County-level vital statistics data necessary for constructing FSS come from the U.S. Centers for Disease Control and Prevention (CDC) WONDER database and covers a total of 132 large U.S. counties over the 1981-2018 period.[14][15] Given that the CDC censors data for counties experiencing sufficiently low mortality, and for similar empirical reasons outlined in Section 4.1, analyses corresponding to these data focus on counties with at least 10 death in each year of the study period and at least 10,000 Black residents.[16] Moreover, all counties within Indiana and Tennessee are again excluded from the donor pool. While the City of St. Louis remains a distinct treatment unit as an independent city, the county-level analysis instead focuses on Jackson County as the second treatment unit–accounting for the overwhelming majority of Kansas City's residential population.

[12]These requirements also result in (non-Hispanic) White estimation samples based on a total of 142 cities. Arrest and officer assault donor pool sizes possess slight differences due to these restrictions as well.

[13]Contrary to homicide trends, White Missourians make up approximately 85 percent of the state while accounting for nearly 93 percent of all suicides (UMSL, 2015).

[14]Consistent with previous literature, the ICD-9 codes for homicide are E960-E969 and ICD-10 codes X85-Y09. Firearm homicide mortality includes ICD-9 codes E965.0-E965.4 and ICD-10 codes X-93-X95. ICD-9 codes for suicide mortality includes E950-E959 and ICD-10 codes X60-X84. Lastly, firearm suicide mortality includes ICD-9 codes E955.0-E955.4 and ICD-10 codes X72-X74.

[15]Corresponding county-level homicide and firearm homicide rates also come from these data in order to carry out homicide-related robustness checks.

[16]This study also combines the five boroughs of New York City into one control unit.

This analysis also constructs a second measure of gun proliferation based on state-level FBI National Instant Criminal Background Check (NICS) reports and includes a total of 49 states (excluding Indiana and Tennessee) over the 1999-2018 period. The FBI launched NICS in 1998 as mandated by the Brady Handgun Violence Prevention Act of 1993 and requires FFLs to conduct background checks for all potential firearm or explosives purchases.[17] In comparison to the private firearm sales solely subject to the former PTP law, these federal background checks were required before and after the repeal of the Missouri permit-to-purchase law. NICS background checks generally take only a few minutes, but any check taking longer than three days in duration can proceed legally without further inquiry. Handgun and long background check rates, reported per 100,000, reflect potential gun sales as not all checks conducted by FFLs result in a purchase. Similar to aforementioned homicide and arrest analyses, county-level demographic data also come from the U.S. Census. Specifications for both gun proliferation analyses control for racial composition of the population (i.e, percent of the population non-Hispanic Black, non-Hispanic White, and Hispanic), percent of the population ages 15-24, percentage ages 25-44, percent of the population male, percent of residents ages 25 and over with educational attainment less than high school, percent of female-headed households, percent of the population who never married, (race-specific) unemployment rates, (race-specific) poverty rates, and per capita income (measured in 2000 dollars).

### 4.3 Local Administrative Homicide Data

Race-specific changes-in-changes homicide estimates are based on geocoded incident-level homicide data from the City of St. Louis Metropolitan Police Department, Kansas City (Missouri) Police Department, and the Cleveland (Ohio) Police Department over the 2004-2017 period. In contrast to the preliminary homicide data reported by local law enforcement agencies to the FBI in the SHR, these data capture the most recently updated homicide incidents with similar information on victims and offenders involved in each incident. In order to construct race-specific neighborhood-

[17]The study period for these analyses begin in 1999 due to data incompletion in the first year of implementation.

level (i.e., census tract) homicide rates (per 1,000 residents), homicide incidents are first mapped into census tract shapefile boundaries for each respective city using their associated geocoded information and then separately aggregated up to the census tract level for each racial group. Shapefile data come from the CDC PLACES Project and are based on 2010 census tract boundaries (CDC, 2020).[18] Each neighborhood is associated with their racial/ethnic group plurality in 2004–the earliest year for which complete homicide data are available for each jurisdiction. The study sample for these analyses ultimately include a total of 426 predominately Black and White neighborhoods. Given the largely intraracial nature of homicide in Kansas City and St. Louis, race-specific changes-in-changes homicide estimates are constructed separately by neighborhood race. Each specification also controls for (residualized) poverty, unemployment, per capita income, percent of female-headed households, percent of residents with educational attainment less than high school, population racial composition, percentage of residents ages 15-24, and the percentage of residents ages 25-44 based on census tract-level census data.

## 5 Results

### 5.1 Descriptive Statistics

Table 1 describes the pre-intervention demographic characteristics for both Missouri cities and their relevant control groups–in addition to the corresponding state-level and county-level gun proliferation measures. The residential population for the City of St. Louis is roughly split between Black and White racial groups while Whites constitute nearly 62 percent of the residential population in Kansas City. Using the isolation index, Table 1 also confirms the extraordinary levels of segregation seen in both cities according to the maps shown in Figure 2. For example, approximately 81 percent of Black St. Louis residents live in a neighborhood where the average Black resident resides while the corresponding measure for White residents is 78 percent. Residential segregation

[18] The sample of homicide incidents also excludes officer-involved homicide, justifiable homicides, and homicides not mapped into the census tracts for any city.

in both cities vastly exceeds the levels observed in other large U.S. cities within the control group. Black unemployment and poverty are three times higher relative Whites residents in Kansas City and St. Louis, but these racial differences are largely comparable to the experiences of other large cities.

While racial differences in socioeconomic disadvantage within St. Louis and Kansas City remain are comparable to disparities seen elsewhere in the country, pre-intervention gun violence within these cities considerably outpaces the average rates of the control group. Average Black firearm homicide rates in both cities are approximately nine times greater than the rates observed among White victims. Moreover, average Black firearm homicide rates among the treatment cities are more than twice as large as similar rates among control cities. However, White firearm homicide rates remain fairly comparable to the pre-intervention homicide rates observed in other large U.S. cities. Similar disparities also exist in non-gun homicide, aggravated assault arrests, and weapons arrests–with gun proliferation playing a salient role in the latter two enforcement activities. Gun assault rates are also considerably higher among law enforcement in St. Louis and Kansas City relative to other large cities. These pre-intervention statistics strongly suggest that average firearm homicide rates within the control group would serve as a poor counterfactual for both Missouri cities in the absence of the repeal. Interestingly, pre-intervention murder clearance rates are fairly similar in both Missouri cities when compared to the control group.

Table 1 also compares pre-intervention gun market characteristics using the state-level NICS background check rates by weapon type and the county-level FSS gun ownership measure corresponding to each market. For county-level FSS, the City of St. Louis again stands as an independent city while the column for Kansas City instead refers to Jackson County which accounts for the vast majority of the city's population. Beginning with the state-level gun market activity, one notices that Missouri handgun background check rates are slightly lower when compared to other states while long gun rates are somewhat larger. While not all FFL background checks result in sales, these descriptive statistics suggest that primary gun market activity in Missouri and the control group are roughly comparable in the years leading up to the repeal. Finally, the county-level FSS measure implies that local gun ownership rates across St. Louis and Jackson County are very similar to the average rates among control counties at slightly more than 40 percent.

## 5.2 Missouri PTP Repeal and Gun Proliferation

In assessing the impact of the PTP repeal on Missouri gun violence, an important question remains the extent to which the repeal led to an important supply shock involving the movement of firearms from primary markets (i.e., the commercial sale of firearms by FFL gun dealers) to secondary markets (e.g., the sale and transfer of firearms through private sales). Table 2 provides the generalized synthetic control results based on the county-level FSS gun ownership measure and state-level NICS background checks by weapon type. Table 2 also suppresses the coefficients associated with covariates in each model in order to focus on the main causal effects of interest. The county-level FSS measure captures average gun market activity and provides suggestive evidence of transfers in gun ownership from “legal" to “illegal" gun owners primarily through expanded access to secondary markets (Duggan, 2001; Cook and Ludwig, 2006). Starting with column one, these results suggest that the PTP repeal led to a statistically significant 9.97 percentage point increase in county-level FSS or a 24 percent increase relative to the pre-intervention mean.[19] These results imply a 24 percent increase in local gun ownership across these markets, relative to the pre-intervention mean, on average.

State-level NICS background check rates paint a complementary picture regarding post-repeal changes in *primary* gun market sales among Missouri FFL gun dealers. Given that all firearms originate from some primary market, increasingly domestic markets in the case of post-repeal Missouri, these sales play an essential role in supplying underground markets with firearms and potentially affecting gun violence within the state. Furthermore, the provisions of the former PTP

[19] The GSC cross-validation procedure also yields a model with one latent factor and a MSPE of 54.42. Information on any estimated latent factors, factor loadings, and implied weights corresponding to the main GSC estimates can be found in the supplemental appendix of the paper.

law meant that most changes in gun supply should overwhelmingly operate through an increase in handgun sales as opposed long gun sales. The second and third columns of Table 2 confirm that this is indeed the case. These results indicate that the PTP repeal led to a large, and statistically significant, 1,387 increase in potential handgun sales per 100,000 throughout the state of Missouri. Column three also shows a positive increase in long gun background checks, on average, but this increase is not statistically significant at conventional levels.

Figure 3a compares the actual trends in potential handgun sales for the state of Missouri with the estimated trends for (generalized) 'synthetic Missouri' while Figure 3b provides the corresponding dynamic average treatment effect and associated 95 percent confidence intervals. These figures provide strong visual evidence that Missouri experienced exponential growth in the market for handguns immediately following the PTP repeal–reaching 1,400 handgun checks per 100,000 in the first full year of the repeal and 2,000 handgun checks by 2014. Collectively, these results provide strong evidence that the gun supply shock within Missouri primarily operated through an increase in handgun proliferation. This increase in sales could reflect the lower post-repeal costs of firearm acquisition among both legal and illegal gun owners throughout the state. With more recent work confirming the substantial role of straw purchasing behavior in illegal gun proliferation (Cook et al., 2014, 2015), rather than large scale gun trafficking operations (Kleck and Wang, 2009), this gun supply shock is most likely driven by both the removal of the associated fee for each permit background check and the lower barriers to firearm ownership within the underground market for firearms.

### 5.3 Race and Post-Repeal Homicide

The preemption model discussed in Section 2 yields sharp predictions concerning the effect of PTP repeal on racial differences in homicide. To the extent that the PTP repeal lowered offending costs through a decrease in firearm investment costs, the large firearm supply shock could produce an amplification effect characterized by large and sustained increases in Black homicide and to a lesser extent White homicide. Table 3 shows the main city-level GSC results for homicide victimization in St. Louis and Kansas City involving different forms of weaponry across racial groups. The results shown in the first three columns of Panel A make clear that the increase in overall homicide homicide largely remains attributable to an increase in homicide victimization among Black Missourians.[20] More specifically, the PTP repeal led to a statistically significant increase of 13.20 Black homicide deaths per 100,000 or a 19 percent increase relative to the pre-intervention mean, on average. White homicide victimization in both cities also appear to increase although this result is not statistically significant at conventional levels.

However, the remaining results imply that the average effect of the PTP repeal on Black homicide involves an important weapon substitution effect. Column five of Panel A shows that the PTP repeal led to a statistically significant increase of 16.70 deaths per 100,000 or a 35 percent increase relative to the pre-intervention period. The racial differences in the point estimates for firearm homicide are also significant at the five percent level. The weapon substitution effects becomes readily apparent when comparing these results to estimates shown in the first three columns of Panel B focusing on non-gun homicide rates. Focusing again on Black Missourians, these results indicate that the PTP repeal led to a statistically significant 3.76 (22 percent) *decrease* per 100,000 for Black homicide victimization not involving a gun of any kind. White non-gun homicide also falls, but these declines fail to achieve statistical significance. Similar to the state-level background check results shown in Table 2, the PTP repeal did not produce any meaningful changes in long gun homicides for any group and again confirms that the gun supply shock was overwhelming driven by an increase in firearm proliferation as one might expect under the previous permit-to-purchase law regime.

Figure 4 provides the dynamic average treatment effect results with respect to firearm homicide

[20]Table 3 suppresses the coefficients associated with covariates in each model in order to focus on the main causal effects of interest, but estimates related to the race-specific segregation measures yield additional insight into the relationship between this variable and overall homicide. While statistically significant only for the Black isolation index measure, the associated coefficients on the Black and White segregation measures each have the expected sign according to the preemption model characterized by offender-contingent costs. More specifically, an increase in the Black (White) isolation index is associated with an increase (decrease) in overall homicide.

for both racial groups. Figure 4a largely confirms the necessary parallel trends between the average firearm homicide trends for both cities and their synthetic counterpart. However, the dynamic average treatment effects lends some additional insight into the temporal nature of post-repeal gun violence for Black and White Missourians in both cities. The average treatment effect estimates for Black firearm homicide shown in Figure 4b suggest that much of the escalation in gun violence occur during approximately the first three years and the last five years of the post-repeal period–peaking at 25 and 30 Black firearm homicides per 100,000 in each of these sub-periods, respectively. In contrast to the average post-repeal effects, the dynamic results for White firearm homicide show a statistically significant increase of nearly 10 White firearm homicide deaths per 100,000 over the 2016-2018 period. The heightened levels of city-level gun violence inspired several interventions by law enforcement agencies, prosecutors, and other parties interested in reducing firearm homicide–providing some potential explanations for the short-lived reductions in post-repeal gun violence. These mostly temporary interventions included the introduction of the Acoustic Gunshot Location System (AGLS) in St. Louis' most violent neighborhoods (Mares and Blackburn, 2012), undercover ATF storefront operations targeting the illegal acquisition of firearms (DOJ, 2016), a temporary gun monitoring pilot program within the St. Louis local courts to exclusively tackle gun-related offenses (Rosenfeld et al., 2014), and an one-year foot patrol experiment in Kansas City which began in January 2011 (Novak et al., 2015).

A prominent concern regarding the deregulation of secondary firearm markets involves expanded access to these weapons by adolescents (Cohen and Ludwig, 2003; Cook and Ludwig, 2004; Mocan and Tekin, 2006; Carr and Doleac, 2018). For example, Cook and Ludwig (2004) finds evidence that a 50 percent increase in county-level FSS is associated with a two-fold increase in teen gun carrying with this effect being more prevalent among Black youth. Given the large effect of the PTP repeal on county-level FSS in Kansas City and St. Louis, Figure 5 further assesses the extent to which increased gun proliferation in both cities coincide with important changes in youth homicide victimization across racial groups.[21] In addition to confirming the familiar age gradient in criminal behavior, the GSC results in Figure 5a suggests that the PTP repeal produced statistically significant increases in Black firearm homicide for all age groups except among victims ages 0-14. In particular, Black victims ages 15-24 experienced an additional 8.32 firearm homicide deaths per 100,000 and this effect is statistically distinct from the corresponding estimate associated with similarly aged White victims. The effects of the PTP repeal on White firearm homicide is largest for victims ages 25-44, but none of the White firearm homicide estimates possess statistical significance.

In contrast to these results, Figure 5b shows the corresponding effects of the PTP repeal on non-gun homicide across each age and racial group. While this evidence suggests a decline in non-gun homicide victimization among all groups, only the -1.39 decrease per 100,000 among Black victims ages 15-24 remains statistically significant at conventional levels. These results collectively provide strong evidence that post-repeal gun violence in both cities is largely driven by weapon substitution among Black youth, and consistent with the findings from Cook and Ludwig (2004), suggests that the large gun supply shock attributable to the PTP repeal expanded access to secondary markets among illegal owners.[22]

### 5.4 Post-Repeal Gun Violence and Enforcement Activity

The post-repeal escalation in gun violence presents considerable challenges to law enforcement activity seeking to maintain public safety. Illegal gun proliferation exposes officers to greater offender lethality, and similar to the preemption model among civilians, could also influence officers' approach to enforcement activity–including a potential increase in the use of lethal force in civilian interactions (Fryer Jr, 2019; O'Flaherty and Sethi, 2019). However, the City of St. Louis

[21] In the absence of city-level age by race population estimates, both homicide rates are instead constructed using each racial group's city-level total population estimate.

[22] While not directly testable within this framework, another explanation for these findings involves peer effects in gun ownership (Glaeser and Glendon, 1998; Cook et al., 2007).

and Kansas City also experienced two notable criminal justice policy changes with the potential to influence enforcement activity related to gun violence. First, a 2005 Missouri statute allowing the open carrying of a firearm in a vehicle without a permit complicated law enforcement's ability to link weapons to suspects and coincided with an increase warrant refusals by local courts (Rosenfeld et al., 2014). In a 2017 survey involving leaders from the St. Louis and Kansas City police departments, both departments overwhelmingly cited the lack of prosecution of gun crimes under this law as a significant challenge to reducing violent crime (MODPS, 2019). Second, both local governments also faced budgetary pressures attributable to the Great Recession challenging their ability to maintain previous levels of policing manpower. While both cities received critical funding from the Department of Justice Community Oriented Policing Services (COPS) grant program, they were each forced to reduce the size of their respective forces (Isom, 2009; Corwin, 2009). Both factors would place downward pressure on gun-related enforcement activities and overall policing efficiency in the presence of post-repeal gun violence (Levitt, 1997; Evans and Owens, 2007; Chalfin and McCrary, 2018; Mello, 2019; Weisburst, 2019; Chalfin et al., 2020).

Figure 6 provides GSC estimates by race describing the effects of the 2007 PTP repeal on various arrest categories. The most striking findings from this figure largely pertain to arrest offenses with known associations to illegal gun proliferation among Black suspects–notably aggravated assault and weapons arrests.[23] These point estimates suggest statistically significant 125 percent and 44 percent decreases in both arrest categories, respectively. Notably, the decline in weapons arrests is statistically distinguishable from the corresponding (non-statistically significant) effect for White arrests. Here, the aggravated assault and weapons arrest effects could be self-reinforcing as the decline in punishment of contemporaneous gun offending could quickly encourage future levels of violence. The PTP repeal also leads to a statistically significant increase in stolen property arrests of

[23]The FBI defines aggravated assault as "an unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury. This type of assault usually is accompanied by the use of a weapon or by means likely to produce death or great bodily harm" (FBI, 2013). According to St. Louis police reports, aggravated assault arrests involving a gun accounted account for roughly half of these arrests in most years (Isom, 2009).

177.40 per 100,000 which possibly supports an explanation based on the increasing attractiveness of stolen firearms within these markets (Helsley and O'Sullivan, 2001; Cook and Ludwig, 2003).[24]. These results also remain consistent with statewide gun trace evidence indicating that illegal guns were making their way to crime scenes more quickly and reflects an increased value that illegal markets place on new firearms as older weapons possess greater risk of malfunction and links to previous crimes (Levitt and Venkatesh, 2000; Webster et al., 2009). Additional evidence from Figure 6 shows statistically significant declines in other assault arrests among White suspects and other sex offense arrests among Black suspects. While these declines could reflect genuine changes in underlying criminal behavior or policing efficiency, they also remain more susceptible to changes in law enforcement reporting.

Figure 7 provides the dynamic average treatment effects associated with the estimates for aggravated assault and weapons arrests. Building on Figure 6, Figure 7A shows a steep decline in aggravated assault arrests among Black suspects immediately after the PTP repeal with small, yet statistically insignificant, declines among White suspects. One feature of the dynamic weapons arrests estimates provided in Figure 7B involves the strong tracking of these arrests with trends in firearm homicide rates. The PTP repeals produces an immediate decline of 200 Black weapons arrests per 100,000 and falls by 400 arrests per 100,000 towards the end of the post-repeal period. White weapons arrests also appear to decline by the end of the study period, but again these estimates are not statistically significant at conventional levels. The results in Figure 7 again confirm the extraordinary declines in policing productivity with respect to arrests involving gun-related offenses.

Interestingly, the PTP repeal does not appear to lead to significant changes in murder arrests

[24]As shown in the appendix, dynamic evidence for Black stolen property arrests suggests that this increase begins almost two years before the PTP repeal. While stolen property arrests indeed remain elevated during the post-repeal period, two other explanations could also account for these results. First, the 2005 Missouri statute allowing for the open carry of guns in motor vehicles without a permit could incentivize suspects in search of illegal firearms to break into these vehicles (Rosenfeld et al., 2014). Second, the St. Louis Metropolitan Police Department also further integrated Compstat technology in an effort to achieve greater efficiency in policing activities (Mokwa, 2006; Slocum et al., 2018). Previous evidence suggests that policing efficiency gains from Compstat are particularly strong for property crime as opposed to violent crime (Roeder et al., 2015).

among suspects from either racial group and reflects a lack of change in policing productivity in the presence of heightened urban gun violence. The results remain consistent with supplementary analyses confirming that the PTP repeal did not generate any statistically meaningful changes in murder clearance rates or other clearance rates characterized by offenses involving a firearm.[25] Finally, increased gun proliferation also challenges the safety of law enforcement officers directly responsible for addressing the documented escalation in gun violence. Similar to trends at the national level, officer deaths are extraordinarily rare events in Kansas City and St. Louis. However, one way of assessing changes in direct harm to officers involves estimating the effect of the PTP repeal on officers assaulted in the line of duty by suspects. While the results of this exercise confirms that the PTP repeal led to (non-statistically significant) declines in the rates of total officer assault and assault by other means (i.e., knife, other weaponry, and unarmed), officer gun assault rates increase on average by 2.33 per 100 officers or a 70 percent increase relative to the pre-repeal period.[26] Figure 8 provides the dynamic average treatment effect for the officer gun assault rate. Figure 8b shows that the estimated increases in officer gun assaults appear almost immediately after the repeal of the PTP law and peak at more than five officer gun assaults per 100 officers by 2011. Thus, the escalation in post-repeal Black gun violence among civilians coincides both with important declines in policing productivity and increases in officer exposure to gun violence while in the line of the duty. Moreover, this deterioration in public safety within Kansas City and St. Louis further intensifies the fear multiplier effect at the heart of the preemption model.

### 5.5 Robustness Checks and Sensitivity Analyses

Table 4 shows that the main results are largely robust to alternative model specifications, estimation procedures, and sample restrictions.[27] The first row of this table reproduces the city-

[25]See the supplementary appendix for additional details.

[26]See the supplementary appendix for additional details.

[27]Robustness check results pertaining to gun proliferation, synthetic control estimation, and officer assaults can be found in supplementary appendix and produce similar conclusions. Given that county-level White homicide is extremely low in some years (i.e., less than 10), the CDC Wonder Database suppresses these values and this results

level results among the preferred specification for comparison purposes. The inclusion of additional covariates and alternative specifications based on the inclusion of certain fixed effects (i.e., city and year fixed effects) each produce qualitatively similar, if not statistically identical, results. Changes in the magnitude of these point estimates should be of no surprise given the importance of historical events such as the crack cocaine epidemic and cross-sectional differences in criminal justice policies or policing. Using county-level vital statistics data also produces a statistically identical (and highly significant) Black firearm homicide point estimate of 14.65 per 100,000 when compared to the corresponding estimate based on the SHR data.

The corresponding difference-in-differences results provide qualitatively similar estimates when compared to the GSC results in the second row–although White non-gun homicides now possess statistical significance with differences in some cases for the magnitude of certain coefficients. As shown in Table 1, equal weighting of cities in the donor pool could serve as a poor counterfactual for the homicide and arrest outcomes under consideration. Similarly, synthetic control estimates also yield comparable treatment effect estimates to the GSC results. However, the synthetic control approach produces an inferior pre-intervention fit for outcomes such as Black firearm homicide and demonstrate the need for model flexibility through additive fixed effects.

The August 2014 events surrounding the death of Michael Brown in Ferguson, MO (St. Louis County) also raises important questions regarding crime and policing practices during the latter years of the post-repeal period. Often identified as the birthplace of the “Black Lives Matter" social movement, protests grew considerably within the greater St. Louis area with escalating tension between some protestors and local law enforcement (DOJ, 2014). Commonly referred to as the “Ferguson effect," several studies examine the extent to which these events influenced enforcement activity either through the redistribution of policing resources in order to address the rising protests or greater scrutiny of police department behavior with mixed results (Rosenfeld, 2015; MacDonald, 2019; Devi and Fryer Jr, 2020).[28] In order to examine extent which the aforementioned events

in incomplete data. Thus, these findings focus only on total homicide and non-Hispanic Black homicide.

[28] Devi and Fryer Jr (2020) specifically finds that DOJ “patterns-or-practice" investigations, taking place on or after the

influence the main results from this paper, the analysis also restricts the study period to end in 2013 and leads to a qualitatively consistent story with results from the full study period–with the only notable difference involving the Black weapons arrests estimate no longer possessing statistical significance at conventional levels. As shown in Figure 7B, this finding could reflect a slight lag in the decline of Black weapons arrests with dynamic evidence of significant decreases in Black weapons arrests in the years leading up to 2013. These results clearly show that the weapon substitution effects documented in this study are largely attributable to the PTP repeal and not the 2014 events in neighboring Ferguson. Even in the presence of a potential Ferguson effect, these stories should generally be seen as complementary with increased gun proliferation altering the lethality of post-repeal violence relative to other cities.

The potential contamination of the donor pool could bias any estimate of the PTP repeal effects if guns flow from Missouri to surrounding gun markets corresponding to cities in border states (Knight, 2013). Accounting for this possibility, Table 4 re-estimates the effects of the PTP repeal on each of the main outcomes of interest with the results from this exercise demonstrating that the exclusion of these cities does not alter the point estimates in any meaningful way. Lastly, the effects of the PTP repeal could extend beyond the City of St. Louis or Kansas City. The last row of Table 4 focuses exclusively on the cities of Columbia, Independence, and Springfield as treatment cities in producing the GSC estimates for each outcome. While outcomes such as firearm homicide possess considerable noise among the cities, generally oscillating about zero throughout the pre-intervention period, these estimates suggest that Black firearm homicide also increased in these areas–although the results no longer support a Black weapon substitution effect in addition to showing an increase in Black aggravated assault arrests. While the results connected to these smaller cities could support the possibility of greater policing efficiency within their associated

summer of July 2013, on crime in the absence of viral incidents of lethal force videos lead to a reduction in crime while investigations preceded by such incidents produce significant increases in homicide and other felony crime. The DOJ investigation in question specifically involved the Ferguson Police Department within St. Louis County and not the City of St. Louis Metropolitan Police Department.

police departments, the findings provide limited evidence of gun violence in other parts of the state.

### 5.6 Neighborhood-Level Homicide and Social Interactions

One consequence of the fear multiplier effect from the preemption model involves the differential exposure of (eventual) victims to greater post-repeal firearm investment across racial groups. Escalation in Black homicide victimization becomes more pronounced due to significantly lower offending costs in Black neighborhoods and a greater preemptive motive to invest in firearms for the marginal Black offender for whom such an investment is too costly before the repeal. As shown in Figure 2, the intense spatial concentration in gun violence and considerable residential segregation implies that social interactions play a salient role in determining racial disparities in homicide victimization. With many studies associating neighborhoods with stronger social ties (Topa, 2001; Bayer et al., 2008; Patacchini and Zenou, 2013), a natural question for this study remains the extent to which the effects of the PTP repeal extended beyond Kansas City and St. Louis' most violent neighborhoods.

Figure 9 formally tests this prediction from the preemption model by estimating the impact of the PTP repeal throughout the homicide *distribution* separately for predominately Black and White neighborhoods. More specifically, this figure presents changes-in-changes estimates for neighborhood-level homicide rates per 1,0000 residents based on geocoded homicide data from the City of St. Louis, Kansas City, and Cleveland, Ohio Police departments before (2004-2006) and after (2007-2017) the Missouri PTP repeal–with the City of Cleveland possessing comparable levels of segregation, racial composition, and trends in homicide victimization.[29] For each subfigure, the vertical axis provides the race-specific quantile treatment effect while the horizontal axis describes the $\tau^{th}$ decile of the race-specific homicide distribution among predominately Black and White neighborhoods.

[29]As shown in the appendix, Cleveland also remains one of the most segregated cities in the country with Black Americans accounting for more than half of the city's residential population.

Beginning with $\tau = 0.2$ in Figure 9a, the effects of the PTP repeal appear to increase monotonically throughout the distribution with this increase in homicide not solely restricted to the most violent neighborhoods of St. Louis and Kansas City. Moreover, statistically significant increases in the Black homicide rate extend into interquartile range with effect sizes ranging from 0.25 to over 0.50 per 1,000 residents. Given that increases in homicide operated almost overwhelmingly through an increase in gun proliferation, these results provide suggestive evidence that the PTP repeal increased Black homicide victimization through lower offending costs for the marginal Black offender. Figure 9b shows a similar u-shaped plot characterizing the effects of the PTP repeal on homicide across the distribution of predominately White neighborhoods with the largest quantile treatment effects above $\tau = 0.8$. However, the PTP repeal does not appear to produce any statistically significant impact on White homicide rates at any point in the distribution. Overall, these results remain consistent with predictions from the preemption model where strategic complementarities play an essential role in escalating Black homicide victimization within predominately Black neighborhoods after the repeal.

## 6 Concluding Remarks

Rigorous background check requirements remain essential to the regulation of secondary firearm markets and reducing the proliferation of illegal guns to underground markets. On August 28, 2007, the Missouri state legislature repealed a permit-to-purchase law dating back to the Prohibition era and subsequently lifted any required screening of private firearm transactions. Consistent with the provisions of the former law, this study provides strong evidence that the repeal led to a statewide surge in potential gun sales exclusive to handguns and a 24 percent increase in an established proxy measure of local gun ownership. The lack of a notable increase in the trafficking of firearms to states outside of Missouri remains consistent with previous research suggesting that social connections, perhaps through straw purchasing behavior, play a more salient role in supplying firearms to underground gun markets rather than large scale gun trafficking operations (Cook et al., 2007, 2014, 2015). While a growing body of work provides important evidence concerning gun market responsiveness to various gun-related interventions (Ludwig and Cook, 2000; Duggan, 2001; Koper and Roth, 2002; Webster et al., 2009; Levine and McKnight, 2017), the extent to which other interventions would produce meaningful gun supply shocks depends on differences in state-level legal regimes and enforcement. Even the reinstatement of the former PTP law would not necessarily lead to an immediate symmetric decline in Missouri gun market activity, but could eventually reduce some illegal gun proliferation through a standardized screening of private gun purchase by local law enforcement as older guns transition out of usage.

This study also confirms the general increases in post-repeal gun violence documented in Webster et al. (2014). However, their focus on state-level firearm homicide trends masks important heterogeneity in Missouri gun violence and narrows the policy implications under consideration. The fact that Black neighborhoods in Kansas City and St. Louis account for an overwhelmingly disproportionate amount of post-repeal Missouri gun violence, in response to a statewide policy reform, suggests that the effects of the repeal were greatest for neighborhoods with fertile social conditions for preemptive violence. In contrast, this paper examines the city-level effects of the PTP repeal on homicide across racial groups through the experiences of Kansas City and the City of St. Louis–the largest urban centers of the state which also account for the vast majority of Missouri gun violence. Using city-level data, this study provides new evidence of a post-repeal weapons substitution effect among Black Missourians in Kansas City and St. Louis. In particular, the PTP repeal led to a 35 percent increase in Black firearm homicide and 22 percent decrease in Black non-gun homicide. While post-repeal Black firearm homicide victimization increases to varying degrees for all but victims ages 0-14, additional evidence suggests that this weapon substitution effect is overwhelmingly driven by changes among victims ages 15-24. No conclusive evidence emerges with respect to White gun violence, but dynamic estimates point to a slight increase in White firearm homicide victimization during the latter years of the post-repeal period.

Consistent with the preemption model, post-repeal gun violence extended beyond the most violent Black neighborhoods of Kansas City and St. Louis. The fear multiplier effect resulting from this form of preemptive gun violence is not exclusive to Missouri with evidence of similar effects in other U.S. cities and urban centers outside of the U.S. (O'Flaherty and Sethi, 2010a; Patacchini and Zenou, 2013; Bailey et al., 2020). Previous work suggests that this intense spatial concentration in homicide comes with significant social costs including declines in children's academic performance (Sharkey, 2010; Sharkey et al., 2012), increases in the likelihood of violent behavior later in life (Bingenheimer et al., 2005; Ander et al., 2009), and deterioration in local economic development (Hamermesh, 1999; Greenbaum and Tita, 2004).

This study also provides strong evidence of declining productivity in the policing of gun-related offenses among Black suspects after the repeal–with the PTP repeal leading to a 125 percent decline in aggravated assault arrests and a 44 percent decrease in weapons arrests within this group. Moreover, local law enforcement also saw an increase in exposure to gun violence as officer gun assaults by suspects increased by 70 percent after the PTP repeal. These changes in enforcement activity take place during a period in which the prosecution of gun offenses became more challenging and both police departments experienced some reductions in manpower. Robust evidence from the policing literature suggests that declines in both policing productivity and manpower could exacerbate crime in both cities although the associated benefits might not equally accrue to cities with racial demographics such as those in Kansas City and St. Louis (Levitt, 1997; Evans and Owens, 2007; Leovy, 2015; Chalfin and McCrary, 2018; Mello, 2019; Weisburst, 2019; Chalfin et al., 2020). Interestingly, Chalfin and McCrary (2018) also finds that the City of St. Louis ranks $233^{rd}$ among 242 large U.S. cities in terms of optimal investment in policing and remains one of the most "under-policed" cities in the country. An important direction for future research involves formally examining the relationship between gun control policy and racial differences in policing outcomes (e.g., the use of force). Overall, the deteriorating conditions in policing efficiency appear to contribute to post-repeal gun violence in Black communities within both cities as firearms became more readily accessible.

By examining the racial implications of the permit-to-purchase law repeal, this study opens up conversations involving other policy alternatives shown to reduce violent crime in the absence of stronger background check laws. Such policy alternatives include programs based on cognitive behavioral therapy (Blattman et al., 2017; Heller et al., 2017), youth summer jobs (Heller, 2014; Davis and Heller, 2020), and expanded access to mental health care (Deza et al., 2020). Consistent with the preemption model, nongovernmental organizations in Kansas City and St. Louis also set up anonymous hotlines and offered other dispute resolution measures in order to counter the escalation in largely Black youth gun violence within both cities (McKinstry, 2017). However, the extent to which many of these programs remain effective at larger scale remains an open question (Ludwig et al., 2011). With contemporary public discourse on gun control policies often focused on the most general consequences of these policies, evidence from this study speaks to a critical point made within Loury (2009) in which the alarming racial disparities in outcomes such as homicide warrants deeper social reflection regarding their causes.

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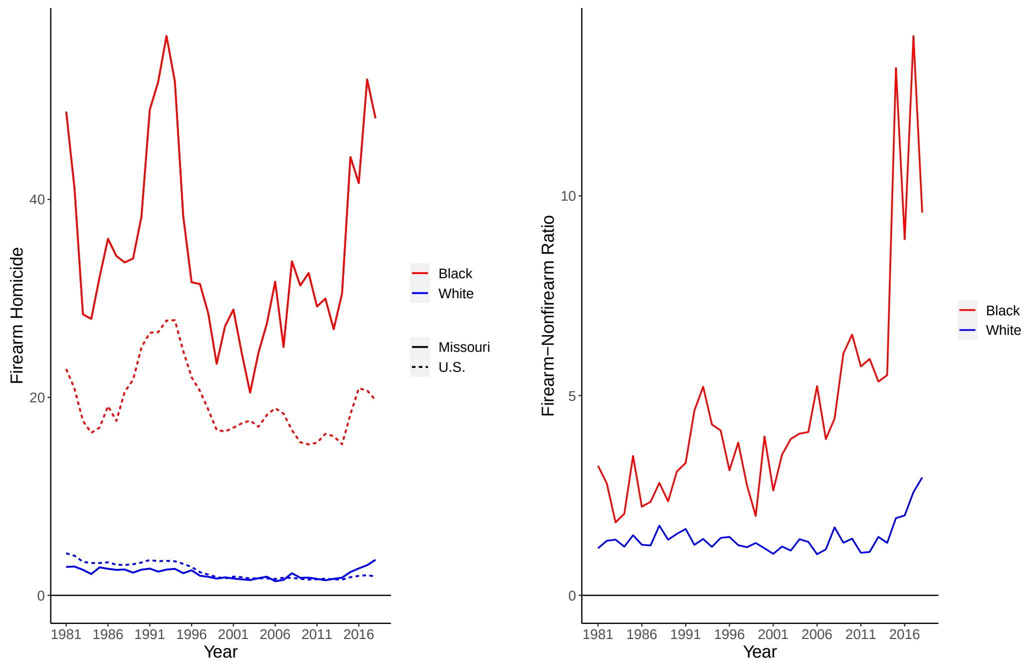
# 7 Appendix

Figure 1: Missouri Firearm Homicide Trends by Race

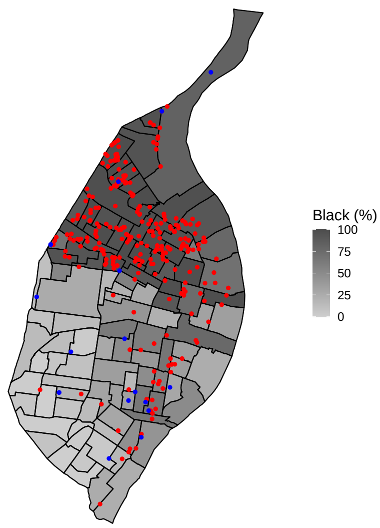



(a.) Firearm Homicide Trends (b.) Firearm to Non-Gun Death Ratio

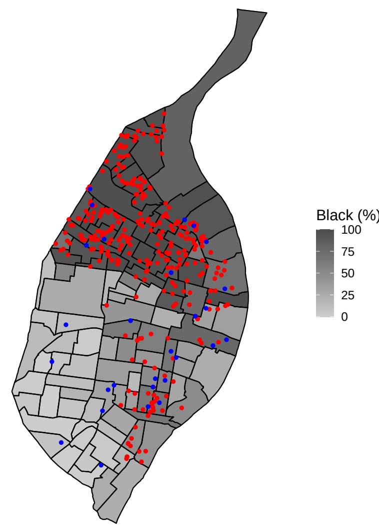
Note: Data for this figure come from the incident-level FBI Supplementary Homicide Reports (SHR) over the 1981-2018 period. These figures exclude officer-involved homicides, institutional killings, and justifiable homicides at the hands of a private citizen. Figure (a.) describes state-level firearm homicide trends for Missouri and all other states in the U.S. by race– excluding Alaska, Hawaii, Idaho, Iowa, Maine, Montana, New Hampshire, New Mexico, North Dakota, Oregon, Rhode Island, South Dakota, Utah, Vermont, Washington, West Virginia, and Wyoming due to data limitations. Figure (b.) shows the ratio of firearm to non-gun homicide deaths among non-Hispanic Black and non-Hispanic White Missourians.

Figure 2: Missouri PTP Repeal and Neighborhood-Level Gun Violence by Race

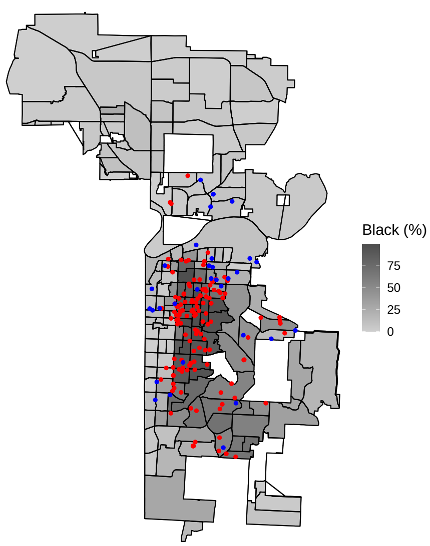
(a.) St. Louis: 2004-2006



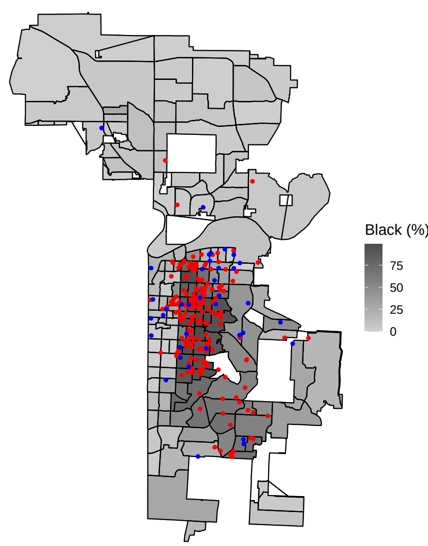

(b.) St. Louis: 2008-2010




(c.) Kansas City: 2004-2006



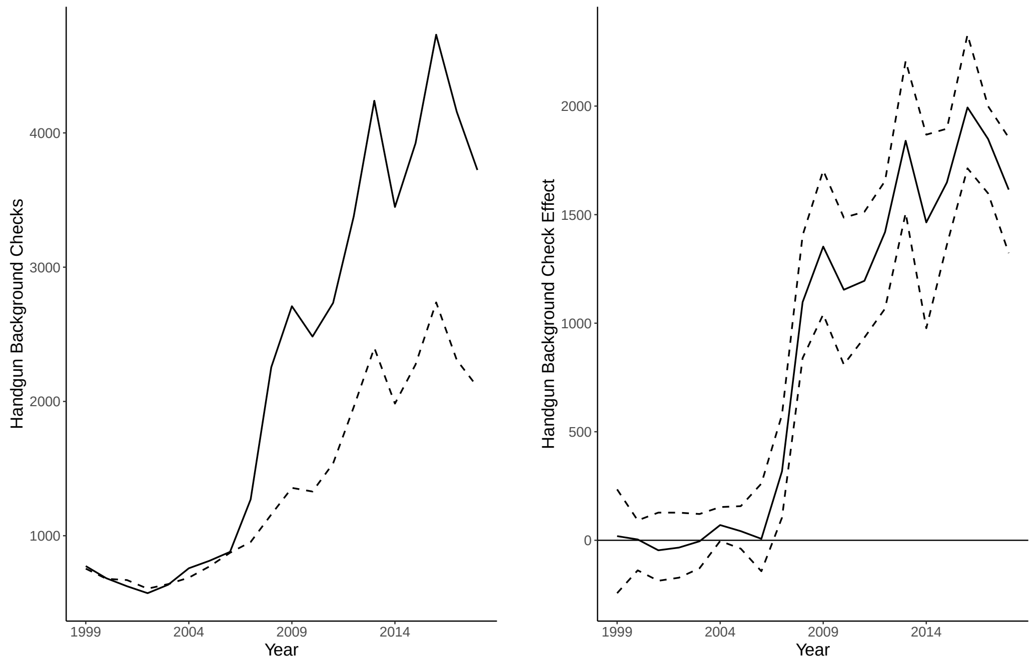

(c.) Kansas City: 2008-2010




Note: Data for this figure come directly from the City of St. Louis Metropolitan Police Department and the Kansas City Missouri Police Department. Figures include individual homicides by race mapped into census tracts shaded by the percent of non-Hispanic Black residents according to the 2010 American Community Survey data. Figures (a.) and (b.) show the neighborhood-level prevalence of firearm homicide by race three (full) years before and after the 2007 Missouri permit-to-purchase law repeal. Figures (c.) and (d.) show similar data for Kansas City, MO. Each individual red circle denotes a non-Hispanic Black homicide victim and blue circles non-Hispanic White homicide victims. The figure excludes officer-involved homicide, justifiable homicides, and homicides not mapped into the census tracts for either city.

Figure 3: Missouri PTP Repeal and Dynamic State-Level Handgun Background Check Results

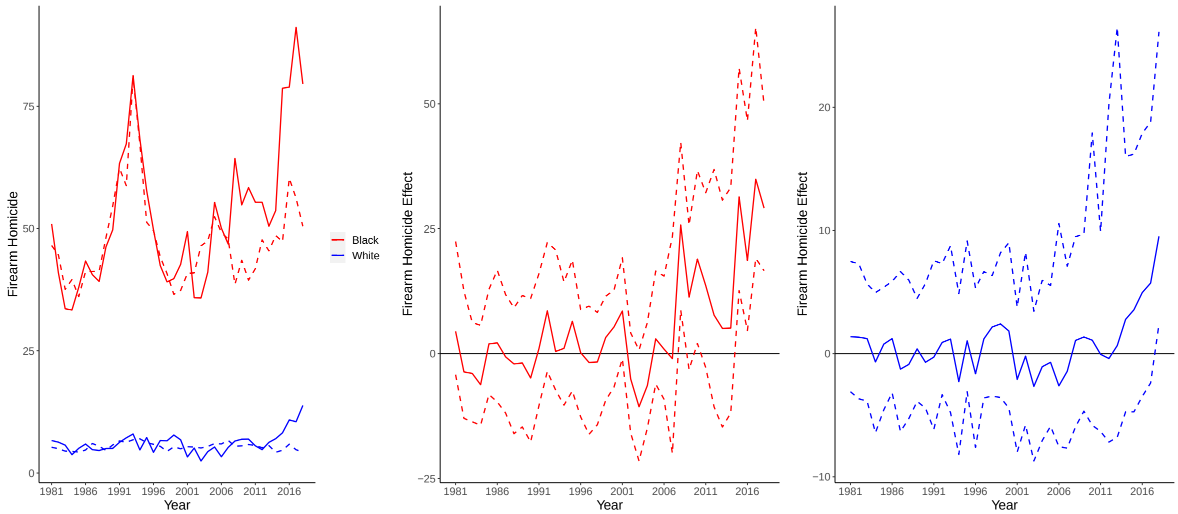
(a.) MO Handgun Checks (b.) MO Handgun Check ATT




Note: State-level generalized synthetic control estimates, using equation (3), are based on data from the FBI National Instant Criminal Background Check System (NICS). The 2007 Missouri permit-to-purchase law repeal is the treatment policy with a pre-intervention period extending from 1999-2006 and a post-intervention period from 2007-2018. The sample excludes Indiana and Tennessee. Figure (a) shows the estimated state-level NICS handgun background check trends per 100,000 residents and Figure (b) the corresponding dynamic average treatment effect with dashed lines displaying 95 percent confidence intervals. These specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. Standard errors are obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

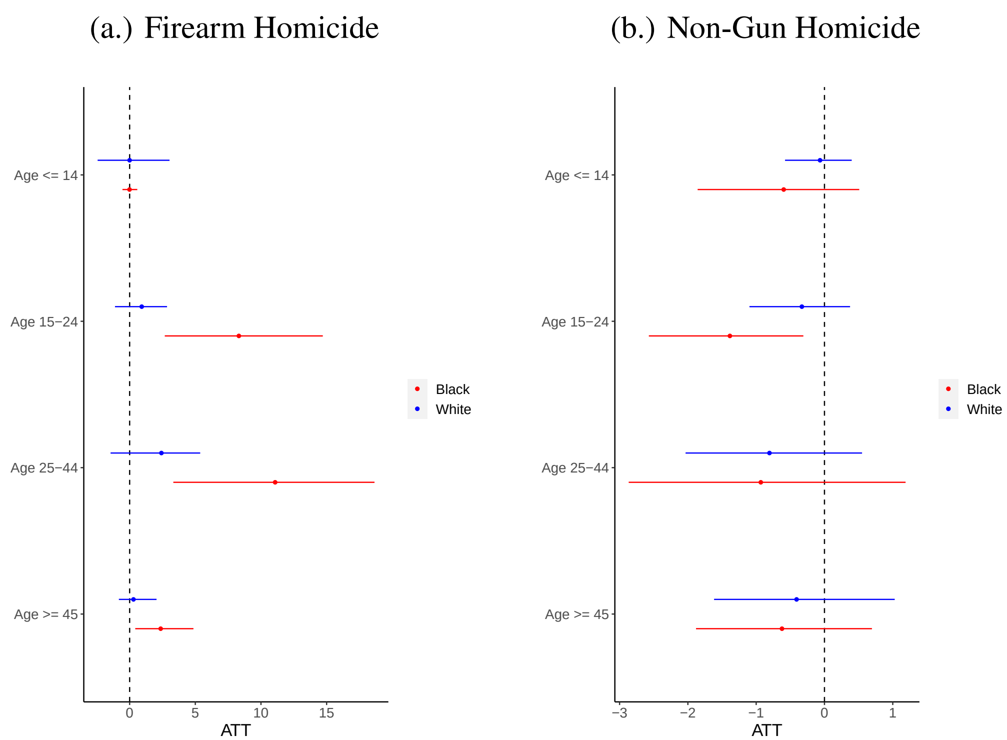
Figure 4: Missouri PTP Repeal City-Level Dynamic Firearm Homicide Results by Race

(a.) Dynamic ATT (b.) Black Effect (c.) White Effect




Note: City-level generalized synthetic control firearm homicide estimates, using equation (3), are based on incident-level data from the FBI Supplementary Homicide Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a.) shows the estimated firearm homicide trends per 100,000 residents, Figure (b.) the dynamic treatment effect for non-Hispanic Black firearm homicide victims, and Figure (c.) the dynamic treatment effect for non-Hispanic White firearm homicide victims–with corresponding dashed lines displaying 95 percent confidence intervals in the latter two figures. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

Figure 5: Missouri PTP Repeal City-Level Homicide Results by Age Group and Race




Note: City-level generalized synthetic control homicide estimates, using equation (3), are based on incident-level data from the FBI Supplementary Homicide Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a.) shows the estimated firearm homicide trends per 100,000 residents across four age groups and Figure (b.) the estimated non-gun homicide trends per 100,000 residents across four age groups–with horizontal bars describing the 95% confidence interval for each estimate. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Each homicide rate is constructed using the total non-Hispanic Black and non-Hispanic White population estimates. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

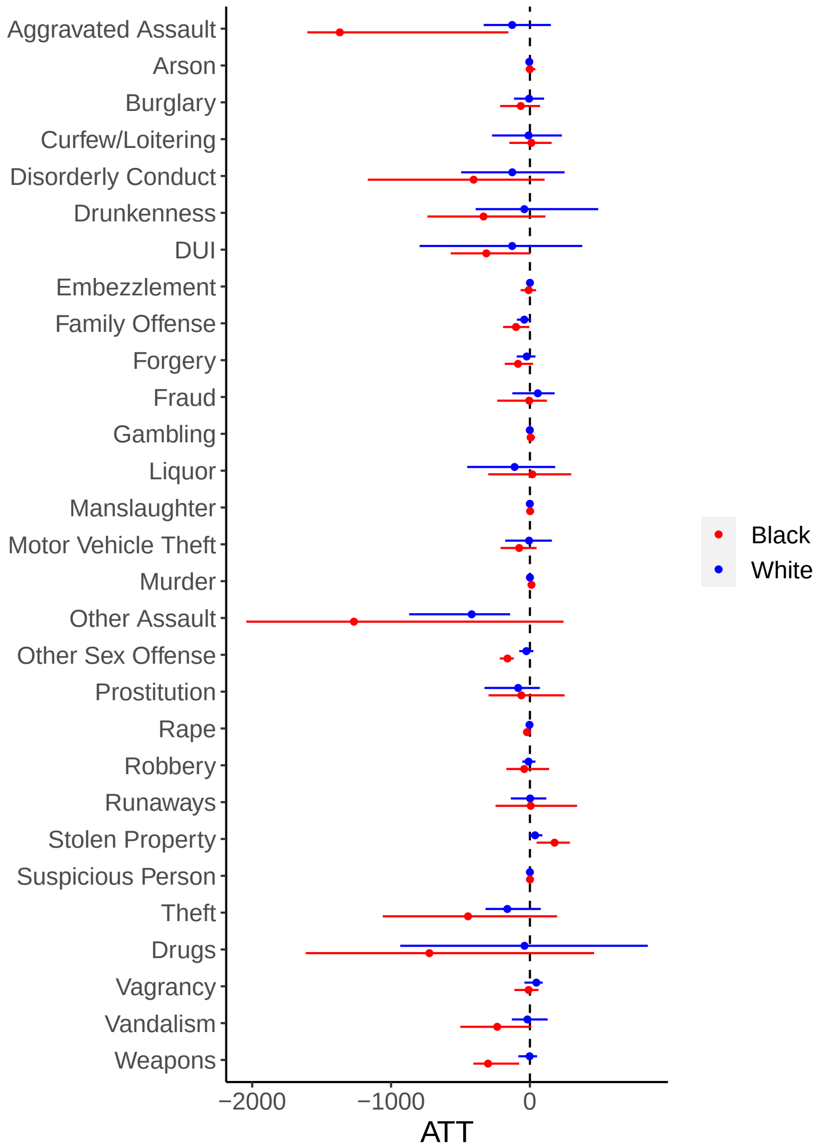
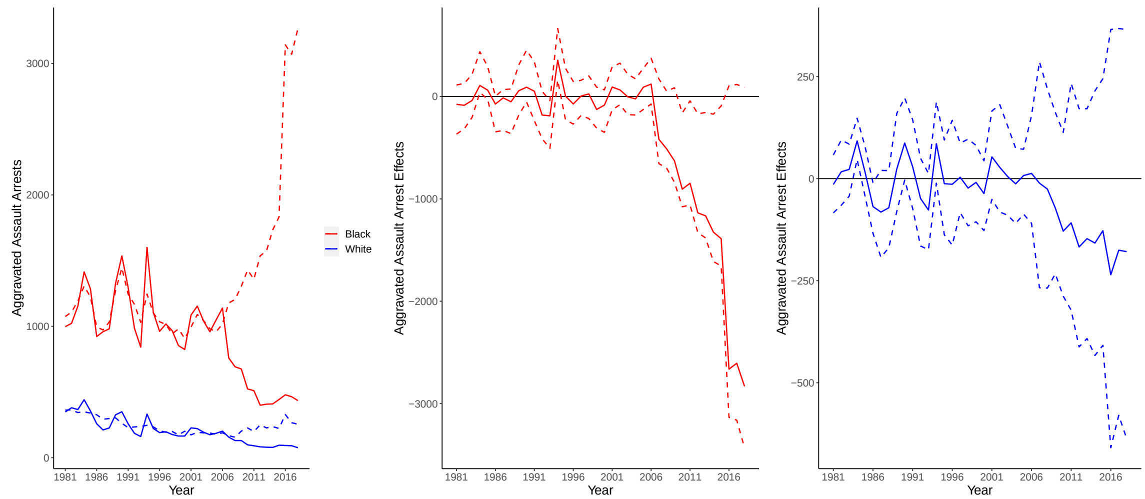



Figure 6: Missouri PTP Repeal Effects on Arrests by Race

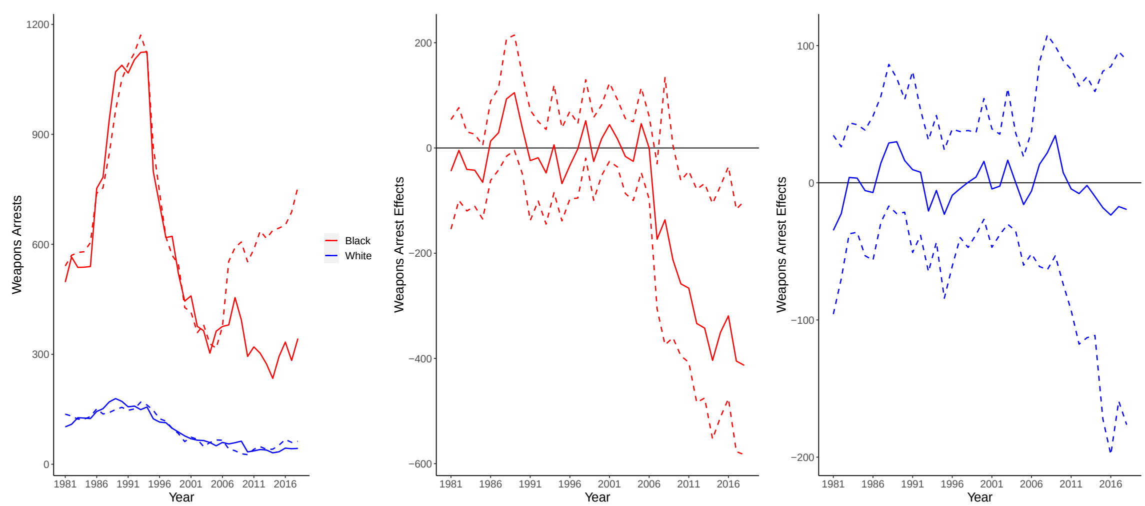
Note: City-level generalized synthetic control estimates, using equation (3), are based on data from the FBI Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. Sample size differs across models according to data availability for each outcome. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Arrest rate estimates are reported per 100,000 residents. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations with horizontal bars describing the 95% confidence interval for each estimate.

Figure 7: Missouri PTP Repeal City-Level Dynamic Arrest Results by Race

(a.) Dynamic ATT (b.) Black Effect (c.) White Effect




A. Aggravated Assault Arrests

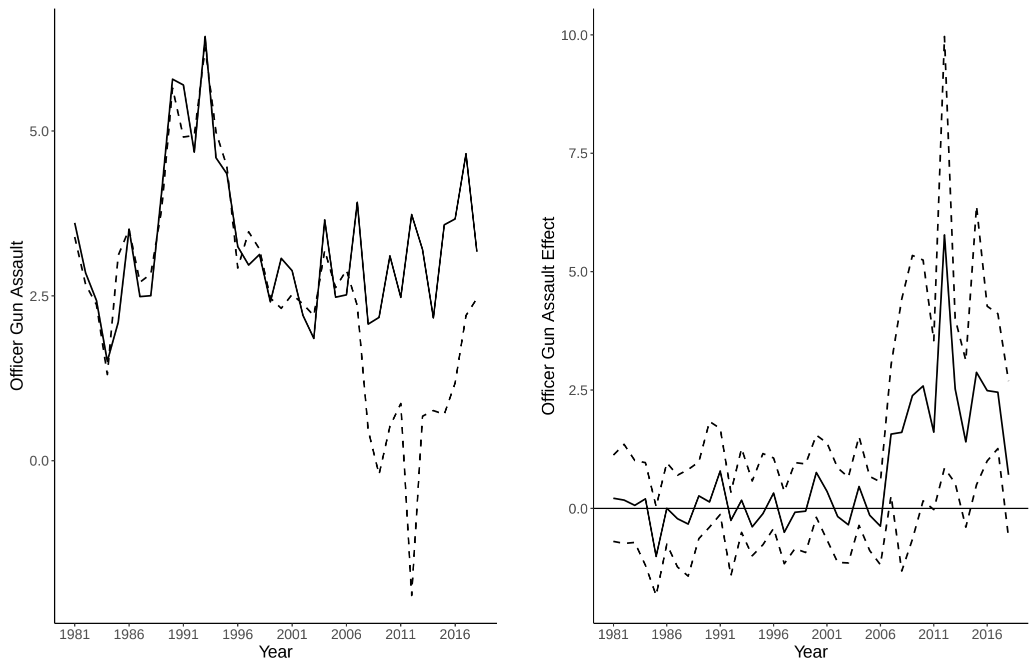



B. Weapons Arrests

Note: City-level generalized synthetic control arrest estimates, using equation (3), are based on data from the FBI Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Column (a.) shows the estimated arrests trends per 100,000 residents, (b.) the estimated dynamic average treatment effect for Black arrests, and (c.) the estimated dynamic average treatment effect for White arrests. Row A provides GSC estimates corresponding to aggravated assault arrests and Row B weapons arrests. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

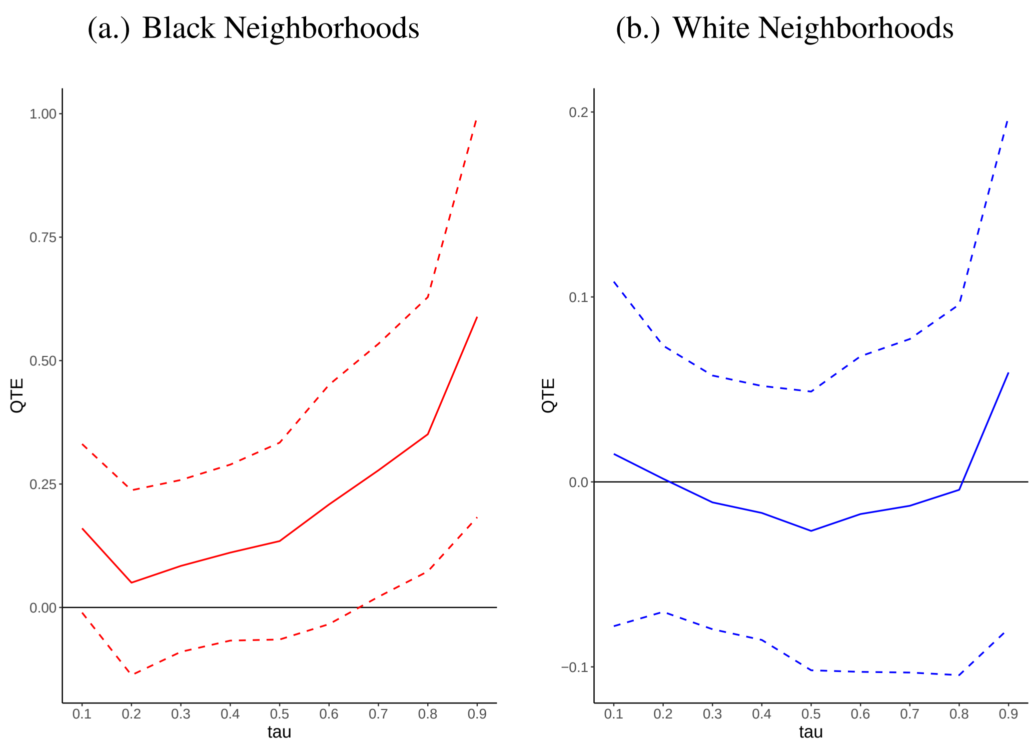
Figure 8: Missouri PTP Repeal and Dynamic City-Level Officer Gun Assault Results

(a.) Officer Gun Assaults (b.) Officer Gun Assault ATT




Note: City-level generalized synthetic control officer gun assault estimates, using equation (3), are based on data from the FBI Law Enforcement Officers Killed and Assaulted Program. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a.) shows the estimated officer gun assault trends per 100 full-time sworn officers and Figure (b.) the estimated dynamic average treatment effect for officer gun assaults. All specifications include non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

Figure 9: Missouri PTP Repeal and Distributional Neighborhood-Level Homicide Results




Note: Neighborhood-level changes-in-changes quantile treatment effect estimates using equation 5 are based on data from the City of St. Louis Metropolitan Police Department, Kansas City Missouri Police Department, and the Cleveland Police Department. The sample excludes officer-involved homicide, justifiable homicides, and homicides not mapped into the census tracts for any city. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with the analysis comparing race-specific, average homicide rates over a pre-repeal (2004-2006) and post-repeal (2007-2017) period. Figure (a.) shows the impact of the PTP repeal on Black homicide rates for predominately Black neighborhoods across the distribution and Figure (b.) the corresponding White homicide rates for predominately White neighborhoods across the distribution. The horizontal axis shows the decile corresponding to the race-specific homicide rate distribution and the vertical axis the quantile treatment effect. Estimates for each figure control for (residualized) poverty, unemployment, per capita income, percent of female-headed households, percent of residents with educational attainment less than high school, percent non-Hispanic, percent Hispanic, percentage of residents ages 15-24, and the percentage of residents ages 25-44. The dashed lines represent 95 percent confidence intervals with bootstrapped standard errors based on a sample of 100 iterations.

Table 1: Descriptive Statistics (1981-2006)

| **Demographic Variables** | St. Louis | Kansas City | Both | Controls | **Outcomes** | St. Louis | Kansas City | Both | Controls |
|---|---|---|---|---|---|---|---|---|---|
| Total Population | 382623 | 441305 | 411964 | 308122 | Firearm Homicide | | | | |
| *Black* (%) | 48.48 | 29.64 | 39.06 | 28.89 | *Black* | 55.17 | 39.86 | 47.51 | 19.61 |
| *White* (%) | 47.31 | 62.07 | 54.69 | 51.01 | *White* | 5.45 | 5.50 | 5.48 | 4.29 |
| Segregation | | | | | Non-Gun Homicide | | | | |
| *Black* | 81.38 | 69.29 | 75.34 | 48.13 | *Black* | 18.68 | 16.23 | 17.46 | 10.01 |
| *White* | 78.03 | 79.99 | 79.01 | 64.69 | *White* | 6.27 | 5.94 | 6.10 | 4.55 |
| Poverty (%) | | | | | Aggravated Assault Arrests | | | | |
| *Black* | 35.47 | 26.82 | 31.14 | 27.84 | *Black* | 1462.00 | 727.90 | 1095.20 | 631.30 |
| *White* | 12.62 | 8.78 | 10.70 | 11.83 | *White* | 352.00 | 149.65 | 250.81 | 270.21 |
| Unemployment (%) | | | | | Weapons Arrests | | | | |
| *Black* | 17.91 | 13.06 | 15.49 | 13.00 | *Black* | 650.50 | 709.80 | 680.20 | 282.90 |
| *White* | 6.27 | 4.53 | 5.40 | 6.01 | *White* | 106.00 | 125.54 | 115.77 | 126.10 |
| Age Group (%) | | | | | Murder Clearance Rate (%) | 73.17 | 65.10 | 69.13 | 71.39 |
| *0-14* | 21.17 | 21.21 | 21.19 | 22.30 | Officer Gun Assault Rate | 4.01 | 2.68 | 3.35 | 0.8694 |
| *15-24* | 15.29 | 14.56 | 14.92 | 16.80 | State FBI Background Checks | | | | |
| *25-44* | 29.47 | 32.03 | 30.75 | 31.05 | *Handguns* | | | 717.40 | 911.60 |
| *45 Plus* | 34.06 | 32.20 | 33.13 | 29.85 | *Long Guns* | | | 2613.00 | 2087.00 |
| Male (%) | 46.17 | 47.84 | 47.00 | 48.10 | County FSS (%) | 40.54 | 41.05 | 40.79 | 43.67 |
| Never Married (%) | 38.60 | 31.14 | 34.87 | 32.79 | | | | | |
| Education: Less than High School (%) | 35.23 | 20.85 | 28.04 | 26.91 | | | | | |
| Female-Headed Households (%) | 20.38 | 15.12 | 17.75 | 16.95 | | | | | |
| Per Capita Income | 15204 | 19374 | 17289 | 17694 | | | | | |

Note: Data for this table come from the U.S. Census Bureau, FBI Supplementary Homicide Reports, FBI Uniform Crime Reports, and the CDC WONDER database over the 1981-2006 pre-intervention period while FBI National Instant Criminal Background Check data begin in 1999. The donor pool for Black homicide outcomes consists of 141 cities and 140 cities for White homicide outcomes–with all arrest data dropping New York City due to data limitations. The segregation measure is the race-specific isolation index based on the Census data. Per capita income is inflation adjusted for 2000 dollars. Homicide outcomes exclude institutional killings, officer-involved incidents, and justifiable homicides committed by a civilian. All homicide and arrests rates are per 100,000 residents while the officer gun assault rate by suspects is per 100 full-time sworn officers. With an exception for the arrest outcomes, all race-specific variables refer to non-Hispanic Black and non-Hispanic White groups. In the case of state background checks, “Both" in the third column refers background check rates per 100,000 for the state of Missouri with the corresponding state-level control group. For the county-level fraction of suicides committed with a firearm (FSS), “St. Louis" still refers to the City of St. Louis while the “Kansas City" column now refers to all of Jackson County (i.e., the county accounting for the majority of Kansas City) with the corresponding county-level control group.

Table 2: Missouri PTP Repeal Gun Market Results

| | | NICS Background Checks | |
|---|---|---|---|
| | FSS | Handguns | Long Guns |
| | (1) | (2) | (3) |
| PTP Repeal | 9.97*** | 1387.00*** | 279.10 |
| | (3.32) | (66.47) | (335.60) |
| Level | County | State | State |
| Treatment Units | 2 | 1 | 1 |
| Control Units | 130 | 48 | 48 |
| Pre-Intervention Mean | 40.79 | 637.95 | 2323.95 |
| Unobserved Factors | 1 | 3 | 2 |
| MSPE | 54.42 | 3179.40 | 30386.75 |

*p<0.1, **p<0.05, ***p<0.01.
Note: County-level generalized synthetic control estimates, using equation (3), are based on vital statistics data from the CDC WONDER Database while similar state-level estimates rely on data from the FBI National Instant Criminal Background Check System (NICS). The county-level sample draws on counties with at least 10 deaths in each year of the study period and at least 10,000 Black residents due to data restrictions for places with sufficiently low mortality. Treated units within Missouri includes Jackson County (containing Kansas City) and the City of St. Louis. Each sample excludes geographic units corresponding to Indiana and Tennessee. Each model uses the 2007 Missouri permit-to-purchase law repeal as the treatment policy with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Estimates based on the NICS data use pre-intervention periods beginning in 1999. NICS background checks are expressed in rates per 100,000 residents. All specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

Table 3: Missouri PTP Repeal City-Level Homicide Results by Weapon Type

**Panel A: Firearm-Related Homicide**

| | Homicide | | | Firearm Homicide | | |
|---|---|---|---|---|---|---|
| | All<br>(1) | Black<br>(2) | White<br>(3) | All<br>(4) | Black<br>(5) | White<br>(6) |
| PTP Repeal | 5.08*<br>(2.82) | 13.20**<br>(7.27) | 3.13<br>(2.71) | 4.50**<br>(2.15) | 16.70***<br>(6.59) | 2.40<br>(2.45) |
| Level | City | City | City | City | City | City |
| Treatment Units | 2 | 2 | 2 | 2 | 2 | 2 |
| Control Units | 141 | 141 | 140 | 141 | 141 | 140 |
| Pre-Intervention Mean | 34.78 | 68.52 | 12.25 | 22.58 | 47.51 | 5.48 |
| Unobserved Factors | 4 | 5 | 1 | 5 | 3 | 0 |
| MSPE | 48.46 | 199.20 | 13.96 | 20.00 | 91.90 | 5.42 |

**Panel B: Nonfirearm-Related Homicide**

| | Non-Gun Homicide | | | Long Gun Homicide | | |
|---|---|---|---|---|---|---|
| | All<br>(1) | Black<br>(2) | White<br>(3) | All<br>(4) | Black<br>(5) | White<br>(6) |
| PTP Repeal | -2.29***<br>(0.92) | -3.76**<br>(1.54) | -1.13<br>(1.15) | 0.1716<br>(0.4856) | 0.2734<br>(0.9135) | -0.0908<br>(0.2653) |
| Level | City | City | City | City | City | City |
| Treatment Units | 2 | 2 | 2 | 2 | 2 | 2 |
| Control Units | 141 | 141 | 140 | 141 | 141 | 140 |
| Pre-Intervention Mean | 10.37 | 17.46 | 6.10 | 1.85 | 3.59 | 0.6688 |
| Unobserved Factors | 0 | 1 | 1 | 0 | 0 | 0 |
| MSPE | 9.74 | 33.68 | 5.41 | 2.09 | 7.77 | 0.4480 |

*p<0.1, **p<0.05, ***p<0.01.
Note: City-level generalized synthetic control estimates, using equation (3), are based on incident-level data the FBI Supplementary Homicide Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Panel A includes estimates for either overall homicide rates or firearm homicide rates (per 100,000 residents). Panel B includes either long gun homicide rates or homicide rates that do not involve a gun of any kind (per 100,000 residents). All specifications include percent non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## Table 4: Robustness Checks and Alternative Specifications

| | Firearm Homicide | | | Non-Gun Homicide | | | Aggravated Assault Arrests | | | Weapons Arrests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All | Black | White | All | Black | White | All | Black | White | All | Black | White |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Baseline Estimate (Table 3) | 4.50** | 16.70*** | 2.40 | -2.29*** | -3.76** | -1.13 | -736.70** | -1369.00** | -127.90 | -116.10*** | -301.20** | -2.13 |
| | (2.15) | (6.59) | (2.45) | (0.92) | (1.54) | (1.15) | (161.10) | (397.40) | (114.50) | (25.02) | (78.52) | (32.52) |
| Additional Covariates | 5.00** | 17.95*** | 2.96 | -2.33 *** | -3.30* | -0.6888 | -749.50*** | -1403.00** | -155.40 | -109.10*** | -279.60** | -14.78 |
| | (2.24) | (6.92) | (2.33) | (0.8568) | (1.64) | (1.17) | (153.00) | (366.30) | (119.80) | (26.88) | (74.35) | (32.45) |
| City Fixed Effects Only | 4.62** | 14.66** | 3.30 | -0.9598 | -2.13 ** | -1.33 | -738.00** | -1343.00** | -168.40 | -103.90* | 50.47 | -9.83 |
| | (2.46) | (6.98) | (2.94) | (0.9457) | (1.48) | (1.16) | (167.80) | (384.20) | (150.30) | (50.25) | (86.36) | (33.83) |
| Year Fixed Effects Only | 3.57** | 13.17* | 4.30* | -0.2557 | -0.9878 | -0.6418 | -215.50* | 828.30 | -185.20 | -17.50 | 122.00 | -2.57 |
| | (2.83) | (7.57) | (3.12) | (0.6693) | (1.41) | (1.02) | (134.80) | (301.40) | (169.00) | (44.54) | (120.30) | (28.87) |
| No Fixed Effects | 4.94** | 12.65** | 2.05 | -1.32 * | -2.79* | -1.09 | -867.10** | -618.30 | -128.20 | -31.78 | 171.90 | -1.25 |
| | (2.85) | (8.31) | (3.12) | (0.7734) | (1.71) | (1.03) | (208.00) | (304.70) | (128.90) | (48.42) | (141.00) | (33.15) |
| Difference-in-Differences Estimates | 6.42*** | 12.14*** | 4.26** | -2.28*** | -3.69*** | -1.15** | -213.08*** | -392.43*** | -146.54 | -117.77*** | -305.66** | -161.55 |
| | (2.02) | (3.00) | (1.64) | (0.2431) | (0.4175) | (0.5334) | (77.67) | (91.61) | (127.96) | (40.60) | (121.75) | (128.56) |
| Restricted Study Period (1981-2013) | 1.21 | 12.06** | 0.4204 | -2.08** | -3.53** | -0.5704 | -242.00** | -543.40** | -94.22 | -109.50** | -290.70 | -5.20 |
| | (2.49) | (6.08) | (3.05) | (0.91) | (1.69) | (1.36) | (70.58) | (172.30) | (94.02) | (37.55) | (123.40) | (31.27) |
| No Border State Cities | 4.29** | 16.18*** | 2.52 | -2.25*** | -3.75** | -1.14 | -717.70*** | -1324.00** | -128.10 | -111.00*** | -294.50** | -1.52 |
| | (2.26) | (6.46) | (2.50) | (0.9266) | (1.64) | (1.16) | (158.80) | (383.60) | (113.20) | (24.41) | (72.75) | (32.61) |
| Other Missouri Cities | 3.59 | 17.56*** | 2.61 | -0.6659 | -0.5723 | 1.66 | 82.05 | 353.80*** | 157.30 | 5.72 | 87.08 | -32.96 |
| | (2.05) | (6.36) | (2.29) | (0.7717) | (2.84) | (3.48) | (97.35) | (152.20) | (162.50) | (24.57) | (196.50) | (86.90) |

*p<0.1, **p<0.05, ***p<0.01.
Note: City-level generalized synthetic control estimates, using equation (3), are based on incident-level data from the FBI Supplementary Homicide Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Outcomes are expressed in rates per 100,000 residents. All specifications include percent non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. The additional covariates include the percent of the population ages 0-14, percent married, percent separated, percent divorced, percent high school graduates, and percent some college. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

# Gun Violence in Black and White: Evidence from Policy Reform in Missouri

## Online Appendix

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# Table of Contents

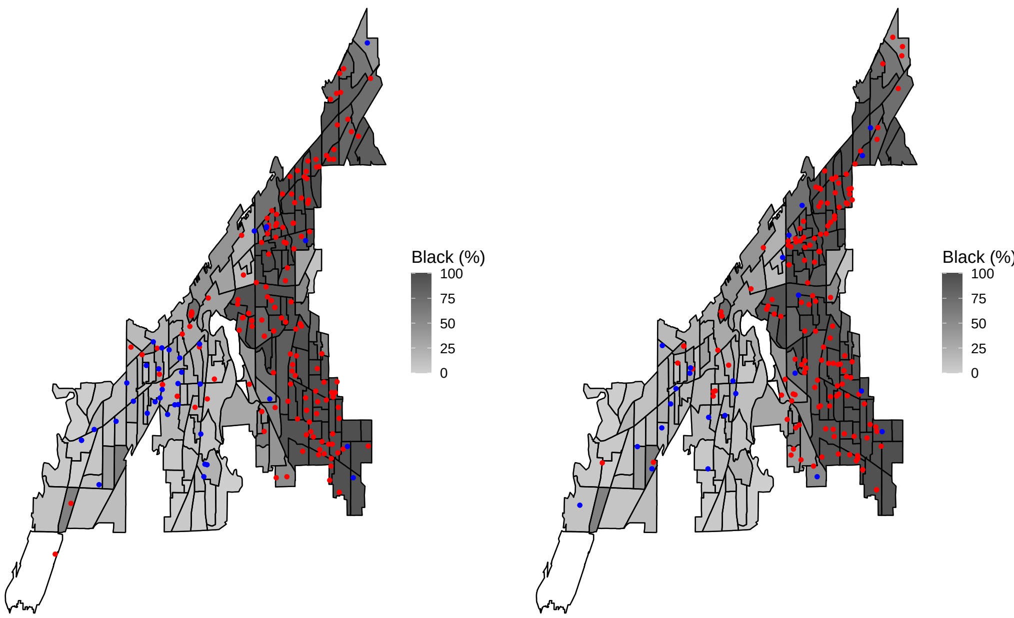
## A1 Supplementary Descriptive Figures and Tables

### A1.1 Missouri Firearm Trace Recovery in Border States: 2006-2013

| Year | Missouri | Arkansas | Illinois | Iowa | Kansas | Kentucky | Nebraska | Oklahoma | Tennessee |
|---|---|---|---|---|---|---|---|---|---|
| 2006 | 30.65 | 1.75 | 0.63 | 1.26 | 7.18 | 0.00 | 0.94 | 0.64 | 0.00 |
| 2007 | 33.33 | 0.96 | 0.84 | 0.60 | 7.99 | 0.00 | 0.78 | 0.37 | 0.00 |
| 2008 | 35.64 | 0.94 | 0.86 | 1.39 | 6.92 | 0.00 | 1.18 | 1.18 | 0.00 |
| 2009 | 40.43 | 0.93 | 1.08 | 1.45 | 6.33 | 0.00 | 0.00 | 0.66 | 0.00 |
| 2010 | 41.19 | 1.65 | 1.00 | 1.08 | 8.31 | 0.00 | 1.06 | 0.73 | 0.00 |
| 2011 | 48.24 | 0.90 | 1.43 | 1.30 | 6.71 | 0.00 | 1.12 | 1.09 | 0.00 |
| 2012 | 47.96 | 0.76 | 1.37 | 1.49 | 6.98 | 0.36 | 1.45 | 0.53 | 0.00 |
| 2013 | 50.34 | 1.05 | 1.69 | 1.49 | 6.50 | 0.00 | 1.87 | 1.06 | 0.00 |

Source: Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) reports

## A1.2 Cleveland Neighborhood-Level Gun Violence by Race



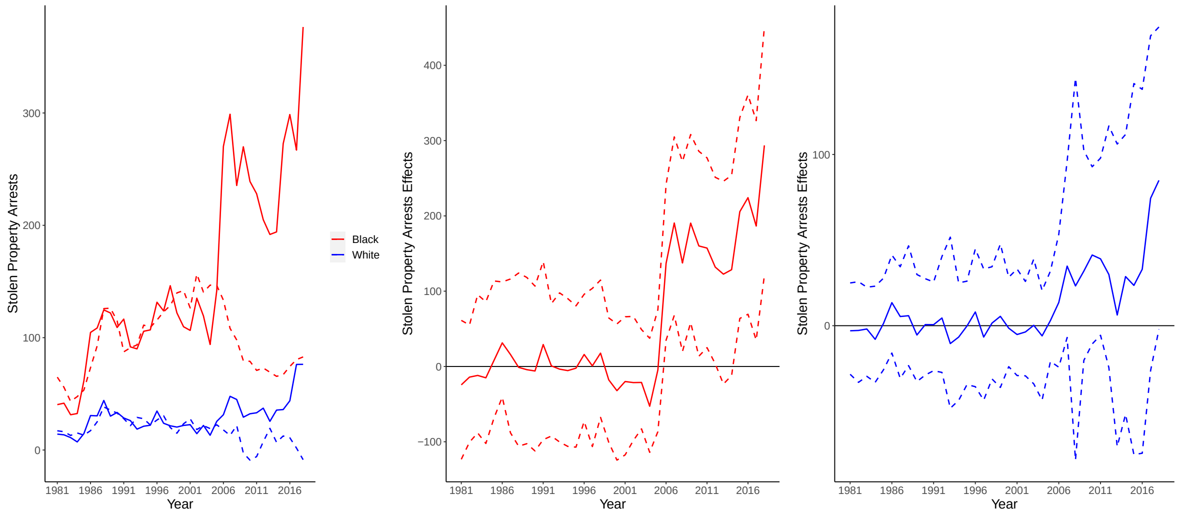

(a.) Cleveland: 2004-2006 (b.) Cleveland: 2008-2010

Note: Data for this figure come directly from the Cleveland, OH Police Department. Figures include individual homicides by race mapped into census tracts shaded by the percent of non-Hispanic Black residents in the 2010 American Community Survey data. Figures (a.) and (b.) show the neighborhood-level prevalence of firearm homicide by race three (full) years before and after the 2007 Missouri permit-to-purchase law repeal. Each individual red circle denotes a non-Hispanic Black homicide victim and blue circles non-Hispanic White homicide victims. The figure excludes officer-involved homicide, justifiable homicides, and homicides not mapped into the census tracts.

## A2 Supplemental GSC Results

### A2.1 City-Level Stolen Property Arrests Results by Race

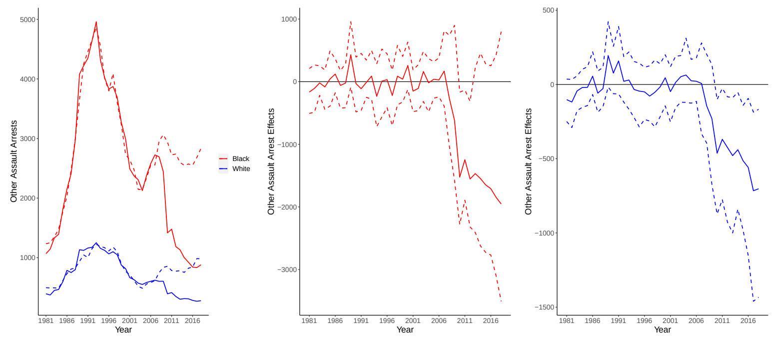
(a.) Dynamic ATT (b.) Black Effect (c.) White Effect



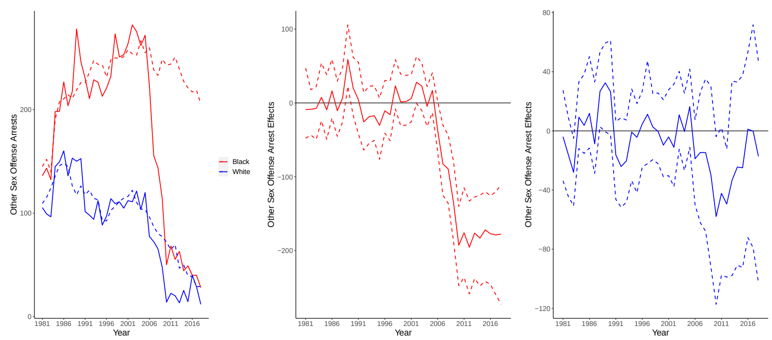

Note: City-level generalized synthetic control stolen property arrest estimates, using equation (3), are based on data from the FBI Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee in addition to New York City due to data limitations. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Column (a.) shows the estimated stolen property arrests trends per 100,000 residents, (b.) the estimated dynamic average treatment effect for Black stolen property arrests, and (c.) the estimated dynamic average treatment effect for White stolen property arrests. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A2.2 City-Level Other Arrest Category Results by Race

(a.) Dynamic ATT (b.) Black Effect (c.) White Effect




A. Other Assault Arrests




B. Other Sex Offense Arrests

Note: City-level generalized synthetic control other assault and sex offense arrest estimates, using equation (3), are based on data from the FBI Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee in addition to New York City due to data limitations. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Column (a.) shows the estimated arrests trends per 100,000 residents, (b.) the estimated dynamic average treatment effect for Black arrests, and (c.) the estimated dynamic average treatment effect for White arrests. Row A provides GSC estimates corresponding to other assault arrests and Row B other sex offense arrests. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

### A2.3 City-Level Officer Assault Rate Results

| | Total | Gun | Knife | Unarmed | Other |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| PTP Repeal | -2.99 | 2.33*** | -0.1574 | -4.03 | -1.21 |
| | (6.44) | (0.7765) | (0.1626) | (5.64) | (1.05) |
| Treatment Units | 2 | 2 | 2 | 2 | 2 |
| Control Units | 132 | 132 | 132 | 132 | 132 |
| Pre-Intervention Mean | 37.39 | 3.35 | 0.6921 | 28.57 | 4.78 |
| Unobserved Factors | 5 | 5 | 1 | 5 | 4 |
| MSPE | 26.91 | 1.67 | 0.1152 | 19.16 | 1.15 |

*p<0.1, **p<0.05, ***p<0.01.

Note: City-level generalized synthetic control officer assault estimates, using equation (3), are based on data from the FBI Law Enforcement Officers Killed and Assaulted (LEOKA) Program. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. All specifications include non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A2.4 City-Level Clearance Rate Results

| | Index | Murder | Burglary | Rape | MV Theft |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| PTP Repeal | 0.2253 | -3.26 | 1.35 | 15.80 | 1.17 |
| | (5.96) | (10.81) | (3.24) | (18.48) | (6.63) |
| Treatment Units | 2 | 2 | 2 | 2 | 2 |
| Control Units | 136 | 135 | 137 | 130 | 136 |
| Pre-Intervention Mean | 16.96 | 69.13 | 9.75 | 52.50 | 9.76 |
| Unobserved Factors | 1 | 0 | 0 | 2 | 5 |
| MSPE | 3.33 | 271.36 | 3.09 | 94.17 | 5.21 |
| | Assault | | | | |
| | Total | Gun | Knife | Unarmed | Other |
| PTP Repeal | -2.12 | 2.34 | 2.06 | 3.83 | -0.8556 |
| | (7.27) | (8.77) | (5.20) | (10.77) | (9.67) |
| Treatment Units | 2 | 2 | 2 | 2 | 2 |
| Control Units | 137 | 123 | 119 | 116 | 121 |
| Pre-Intervention Mean | 59.40 | 37.71 | 61.46 | 56.19 | 50.59 |
| Unobserved Factors | 5 | 5 | 5 | 0 | 1 |
| MSPE | 32.81 | 33.16 | 46.42 | 72.82 | 32.10 |
| | Robbery | | | | |
| | Total | Gun | Knife | Unarmed | Other |
| PTP Repeal | 1.55 | 0.3777 | 3.17 | 0.0031 | -2.61 |
| | (5.85) | (6.48) | (6.33) | (13.56) | (8.62) |
| Treatment Units | 2 | 2 | 2 | 2 | 2 |
| Control Units | 137 | 114 | 101 | 113 | 103 |
| Pre-Intervention Mean | 21.54 | 17.59 | 22.49 | 25.45 | 22.17 |
| Unobserved Factors | 0 | 1 | 0 | 2 | 0 |
| MSPE | 11.00 | 11.70 | 24.87 | 13.27 | 22.10 |

*p<0.1, **p<0.05, ***p<0.01.

Note: City-level generalized synthetic control clearance rate estimates, using equation (3), are based on incident-level data from the FBI Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. Sample size differs across outcomes due to data availability. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A3 Additional Robustness Checks

### A3.1 Robustness Checks and Alternative Specifications: Gun Proliferation Results

| | | NICS Background Checks | |
|---|---|---|---|
| | FSS (1) | Handguns (2) | Long Guns (3) |
| Baseline Estimate (Table 2) | 9.97*** | 1387.00*** | 279.10 |
| | (3.32) | (66.47) | (335.60) |
| Additional Covariates | 8.56** | 1466.00*** | 303.50 |
| | (3.28) | (56.64) | (226.50) |
| County/State Fixed Effects Only | 9.85** | 1537.00*** | 254.50*** |
| | (3.34) | (326.20) | (48.60) |
| Year Fixed Effects Only | 12.14*** | 1344.00** | 461.70*** |
| | (3.90) | (24.84) | (32.76) |
| No Fixed Effects | 9.65*** | 1709.00*** | 400.30*** |
| | (3.55) | (266.70) | (46.96) |
| Difference-in-Differences Estimates | 10.24*** | 1408.34*** | 350.99*** |
| | (2.46) | (121.28) | (98.15) |
| Restricted Study Period (1981-2013) | 7.81** | 1255.00*** | -244.80 |
| | (3.46) | (127.10) | (323.90) |
| No Border State Units | 9.46*** | 1495.00*** | 252.10 |
| | (3.38) | (293.10) | (65.78) |

*p<0.1, **p<0.05, ***p<0.01.
Note: County-level generalized synthetic control estimates, using equation (3), are based on vital statistics data from the CDC WONDER Database while similar state-level estimates rely on data from the FBI National Instant Criminal Background Check System (NICS). The county-level sample draws on counties with at least 10 deaths in each year of the study period and at least 10,000 Black residents due to data restrictions for places with sufficiently low mortality. Treated units within Missouri includes Jackson County (containing Kansas City) and the City of St. Louis. Each sample excludes geographic units corresponding to Indiana and Tennessee. Each model uses the 2007 Missouri permit-to-purchase law repeal as the treatment policy with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Estimates based on the NICS data use pre-intervention periods beginning in 1999. NICS background checks are expressed in rates per 100,000 residents. All specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. The additional covariates include the percent of the population ages 0-14, percent married, percent separated, percent divorced, percent high school graduates, and percent some college. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

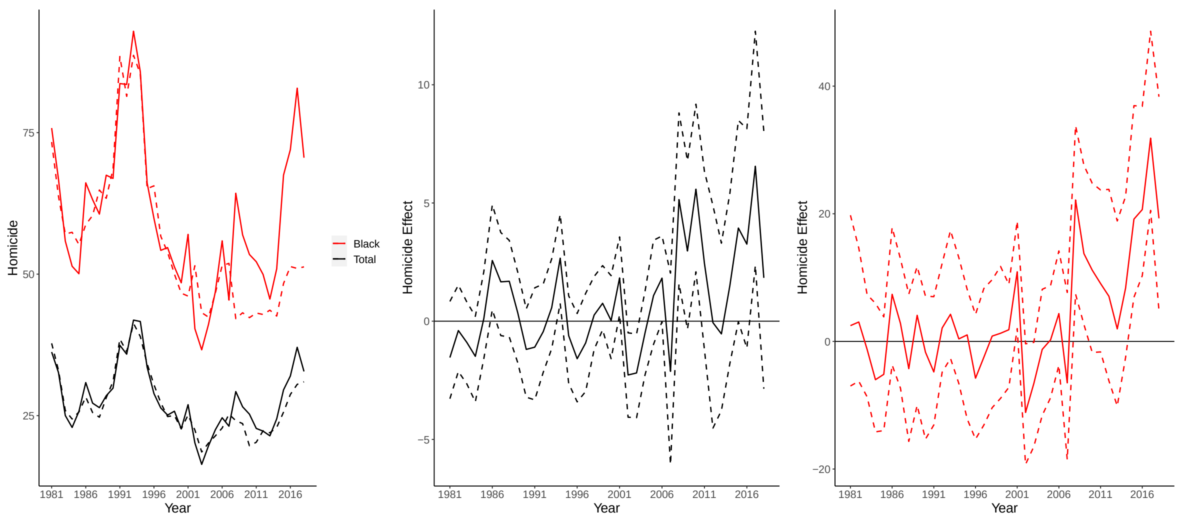
## A3.2 Robustness Checks and Alternative Specifications: Officer Gun Assault Results

| | Total (1) | Gun (2) | Knife (3) | Unarmed (4) | Other (5) |
|---|---|---|---|---|---|
| Baseline Estimate (Table A2.3) | -2.99 | 2.33*** | -0.1574 | -4.03 | -1.21 |
| | (6.44) | (0.7765) | (0.1626) | (5.64) | (1.05) |
| Additional Covariates | -3.03 | 2.36*** | -0.1031 | -1.21 | -3.56 |
| | (5.69) | (0.7745) | (0.1659) | (1.07) | (4.96) |
| City Fixed Effects Only | -3.21 | 2.39*** | -0.1213 | -1.46 | -4.08 |
| | (6.23) | (0.7931) | (0.1983) | (1.28) | (5.67) |
| Year Fixed Effects Only | -1.05 | 2.43 | 0.02754 | -0.8933 | 0.4517 |
| | (6.03) | (1.25) | (0.1280) | (0.9684) | (4.37) |
| No Fixed Effects | -1.81 | 2.33 | -0.0475 | -0.9543 | -1.70 |
| | (5.69) | (1.17) | (0.1334) | (0.8998) | (4.99) |
| Difference-in-Differences Estimates | -0.7903 | 0.1153 | -0.0967** | -0.8187 | 0.0098 |
| | (6.39) | (0.4037) | (0.0409) | (1.05) | (4.99) |
| Restricted Study Period (1981-2013) | -3.48 | 2.64* | -0.2270 | -0.8933 | -2.94 |
| | (8.30) | (1.28) | (0.1681) | (1.09) | (5.01) |
| No Border State Cities | -2.42 | 2.19 ** | -0.1569 | -1.36 | -3.42 |
| | (6.14) | (0.8064) | (0.1601) | (1.16) | (5.41) |
| Other Missouri Cities | -9.02 | 0.1549 | 0.0040 | -1.52 | -5.85 |
| | (5.83) | (0.6496) | (0.1920) | (1.41) | (4.47) |

*p<0.1, **p<0.05, ***p<0.01.
Note: City-level generalized synthetic control estimates, using equation (3), are based on data from the FBI Law Enforcement Officers Killed and Assaulted Program. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Outcomes are expressed in rates per 100,000 residents. All specifications include percent non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black (White) isolation index. The additional covariates include the percent of the population ages 0-14, percent married, percent separated, percent divorced, percent high school graduates, and percent some college. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A3.3 County-Level Dynamic Homicide Results by Race

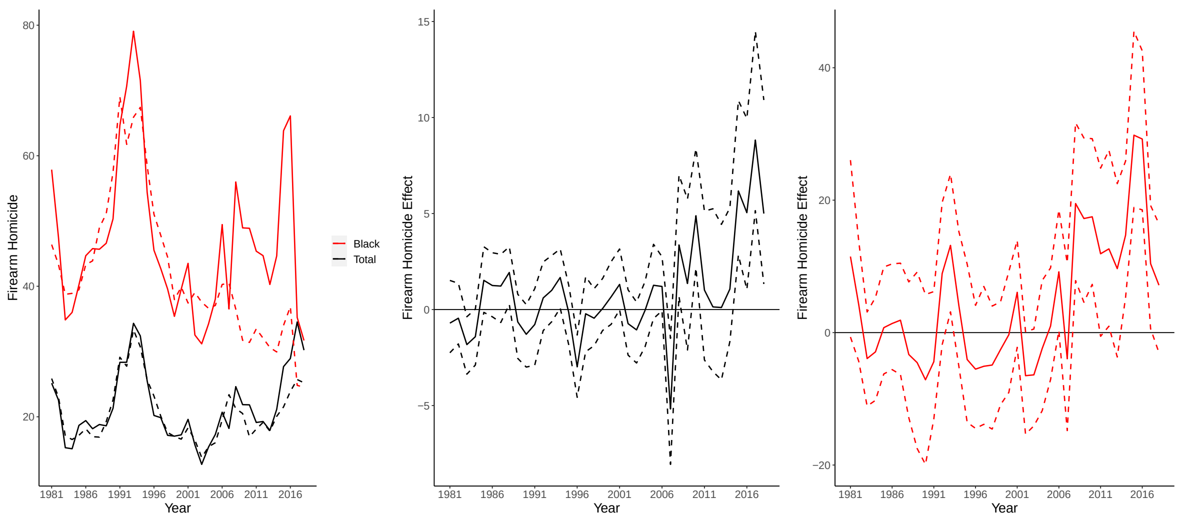
(a.) Dynamic ATT (b.) Total Effect (c.) Black Effect




Note: County-level generalized synthetic control homicide estimates, using equation (3), are based on data from the CDC WONDER Database. The county-level sample draws on counties with at least 10 deaths in each year of the study period and at least 10,000 Black residents due to data restrictions for places with sufficiently low mortality. Treated units within Missouri includes Jackson County (containing Kansas City) and the City of St. Louis. The sample excludes counties within Indiana and Tennessee. The model uses the 2007 Missouri permit-to-purchase law repeal as the treatment policy with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. All specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

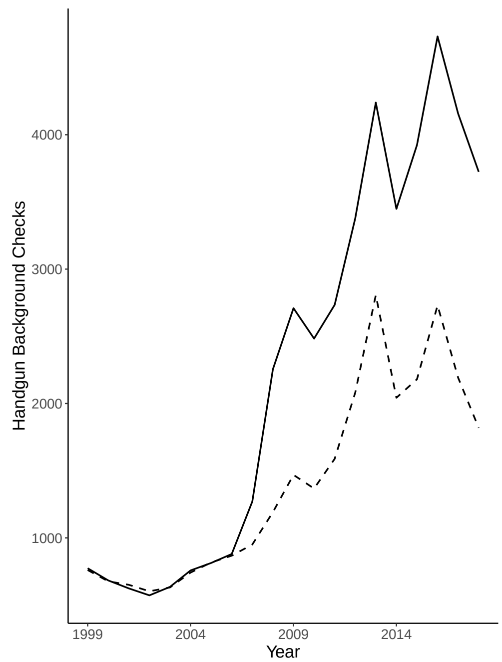
## A3.4 County-Level Dynamic Firearm Homicide Results by Race

(a.) Dynamic ATT (b.) Total Effect (c.) Black Effect



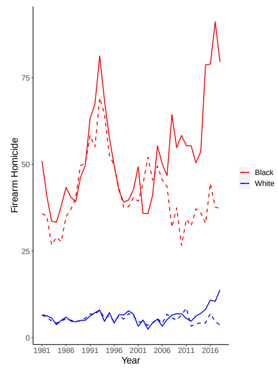

Note: County-level generalized synthetic control firearm homicide estimates, using equation (3), are based on data from the CDC WONDER Database. The county-level sample draws on counties with at least 10 deaths in each year of the study period and at least 10,000 Black residents due to data restrictions for places with sufficiently low mortality. Treated units within Missouri includes Jackson County (containing Kansas City) and the City of St. Louis. The sample excludes counties within Indiana and Tennessee. The model uses the 2007 Missouri permit-to-purchase law repeal as the treatment policy with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. All specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A3.5 Robustness Check: Synthetic Control Handgun Background Check Results

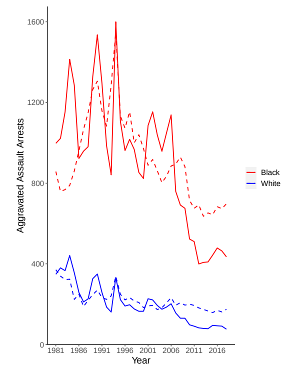



Note: State-level synthetic control estimates are based on data from the FBI National Instant Criminal Background Check System (NICS). The 2007 Missouri permit-to-purchase law repeal as the treatment policy with a pre-intervention period extending from 1999-2006 and a post-intervention period from 2007-2018. The sample excludes Indiana and Tennessee. The figure shows estimated state-level NICS handgun background check trends per 100,000 residents. The underlying specification includes percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and lagged handgun background trends for each year in the pre-intervention period.

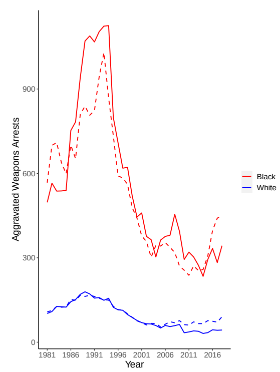
## A3.6 Robustness Check: Synthetic Control Homicide and Policing Results



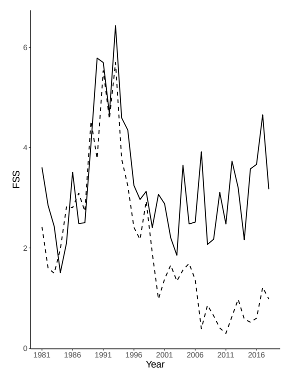

(a.) Firearm Homicide




(b.) Aggravated Assault Arrests




(c.) Weapons Arrests

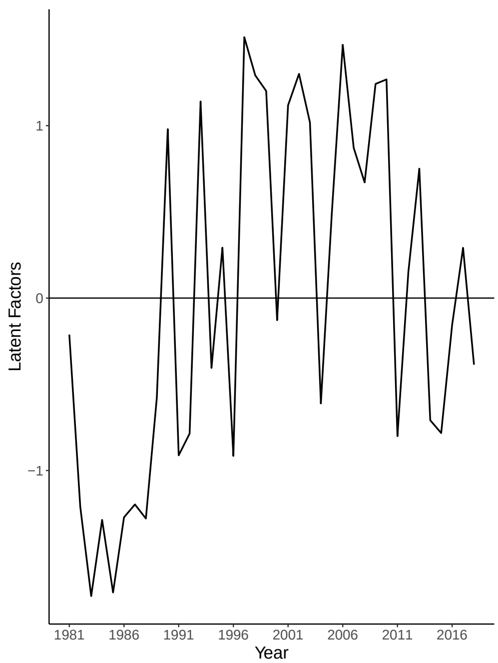



(d.) Officer Gun Assault

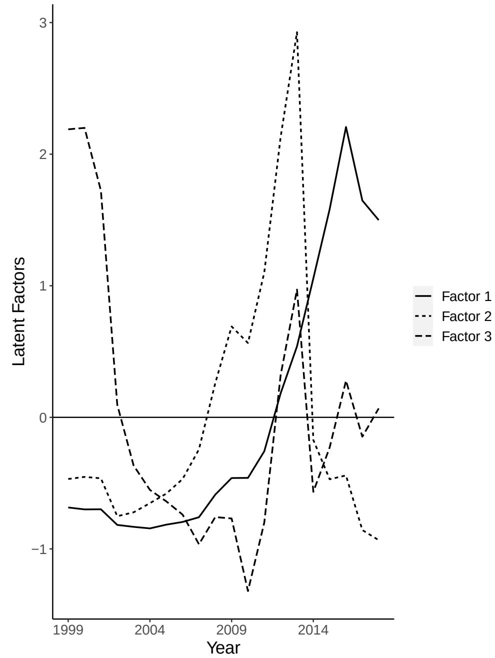
Note: City-level synthetic control firearm homicide, aggravated assault arrest, and weapons arrest estimates are based on incident-level data from the FBI Supplementary Homicide Reports and Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a.) shows the estimated city-level firearm homicide trends per 100,000 residents, Figure (b.) the aggravated assault arrest trends per 100,000, Figure (c.) the weapons arrest trends per 100,000, and Figure (d.) officer gun assaults per 100 officers. All specifications include non-Hispanic Black (or non-Hispanic White), percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, non-Hispanic Black (White) isolation index, and lagged dependent variable values for each year in the pre-intervention period.

## A4 GSC Estimated Latent Factors, Factor Loadings, and Implied Weights

### A4.1 Gun Market Estimated Latent Factors



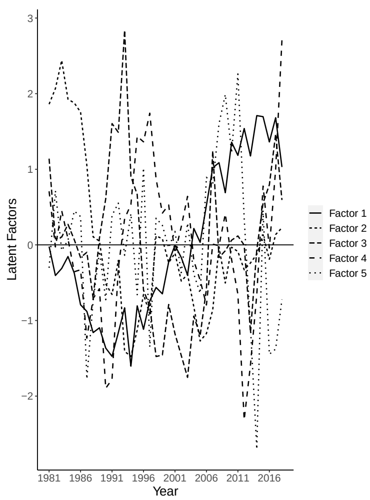

(a.) County FSS



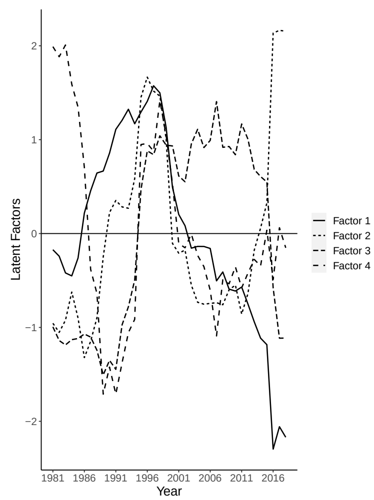

(b.) MO Handgun Checks

Note: County-level generalized synthetic control estimates, using equation (3), are based on vital statistics data from the CDC WONDER Database while similar state-level estimates use data from the FBI National Instant Criminal Background Check System (NICS). The county-level sample draws on counties with at least 10 deaths in each year of the study period and at least 10,000 Black residents due to data restrictions for places with sufficiently low mortality. Treated units within Missouri includes Jackson County (containing Kansas City) and the City of St. Louis. Each sample excludes geographic units corresponding to Indiana and Tennessee. The 2007 Missouri permit-to-purchase law repeal is the treatment policy with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a) shows estimated latent factors for the county-level GSC FSS estimates and Figure (b) the state-level estimated latent factor corresponding to GSC estimates for NICS handgun background checks obtained via a cross-validation procedure. Estimates based on the NICS data use pre-intervention periods beginning in 1999. All specifications include percent of the population non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, and percent of the population ages 25-44. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

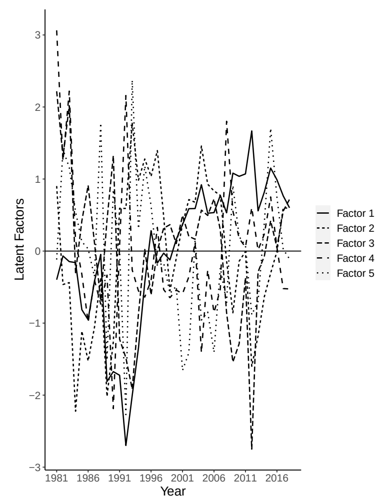
## A4.2 City-Level Gun Violence Estimated Latent Factors




(a.) Firearm Homicide



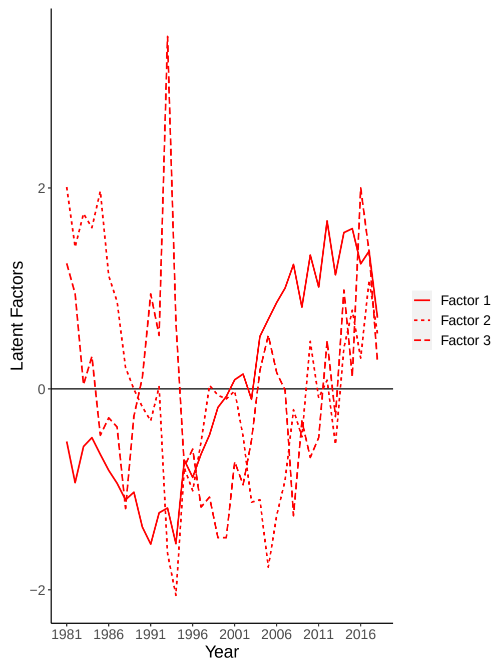

(b.) Agg. Assault Arrests



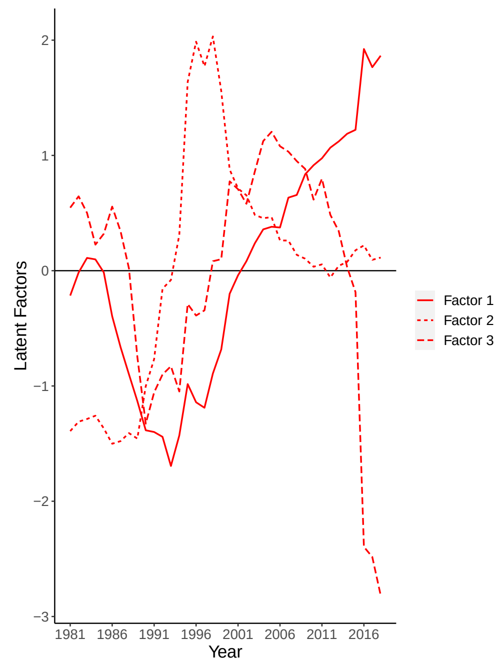

(c.) Officer Gun Assaults

Note: City-level generalized synthetic control estimates, using equation (3), are based on incident-level data from the FBI Supplementary Homicide Reports and Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a) shows estimated latent factors for city-level firearm homicide rates per 100,000, Figure (b) the estimated latent factors corresponding to city-level aggravated assault arrests rates per 100,000, and Figure (c) the estimated latent factors corresponding to city-level officer gun assault rates per 100 full-time sworn officers obtained via a cross-validation procedure. All specifications include percent non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

## A4.3 City-Level Black Gun Violence Estimated Latent Factors




(a.) Black Firearm Homicide




(b.) Black Aggravated Assault Arrests

Note: City-level generalized synthetic control estimates, using equation (3), are based on (incident-level) data from the FBI Supplementary Homicide Reports and Uniform Crime Reports. The estimation sample draws on cities with at least 50,000 residents and 10,000 non-Hispanic Black residents in 2000–with the City of St. Louis, MO and Kansas, MO as treatment units. The sample excludes cities within Indiana and Tennessee. The treatment policy is the 2007 Missouri permit-to-purchase law repeal with a pre-intervention period extending from 1981-2006 and a post-intervention period from 2007-2018. Figure (a.) shows estimated latent factors for city-level non-Hispanic Black firearm homicide and Figure (b.) the estimated latent factors corresponding to Black aggravated assault arrests obtained via a cross-validation procedure. All specifications include percent non-Hispanic Black, percent Hispanic, percent male, percent female-headed households, poverty rate, unemployment rate, percent never married, percent of the population with educational attainment less than high school, percent of the population ages 15-24, percent of the population ages 25-44, and a non-Hispanic Black isolation index. Standard errors obtained using a parametric bootstrap procedure based on $N = 2,000$ simulations.

### A4.4 County-Level FSS Factor Loadings

| County | Factor 1 |
|---|---|
| Newport News city, VA | -25.9843 |
| Durham County, NC | -11.3558 |
| St. Clair County, IL | -7.3893 |
| Union County, NJ | -5.2727 |
| Escambia County, FL | -4.8111 |
| Richmond County, GA | -4.4567 |
| Polk County, FL | -4.0811 |
| Nueces County, TX | -3.9575 |
| Forsyth County, NC | -3.2906 |
| Tulsa County, OK | -3.2772 |
| Sacramento County, CA | -3.2357 |
| Wyandotte County, KS | -3.1819 |
| Brevard County, FL | -2.8350 |
| Douglas County, NE | -2.4488 |
| Hillsborough County, FL | -2.4388 |
| Honolulu County, HI | -2.3629 |
| Mahoning County, OH | -1.9962 |
| Ramsey County, MN | -1.9952 |
| Duval County, FL | -1.9459 |
| Fairfield County, CT | -1.8951 |
| Greenville County, SC | -1.8708 |
| Jefferson County, TX | -1.6909 |

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Table A1 – *Continued from previous page*

| County | Factor 1 |
|---|---|
| Orange County, FL | -1.5593 |
| Pulaski County, AR | -1.5591 |
| Adams County, CO | -1.5241 |
| Suffolk County, MA | -1.4771 |
| Macomb County, MI | -1.3012 |
| New Haven County, CT | -1.2460 |
| Charleston County, SC | -1.1510 |
| Norfolk city, VA | -1.1224 |
| Hudson County, NJ | -1.1163 |
| El Paso County, TX | -1.0716 |
| Jefferson County, KY | -0.9481 |
| Orleans Parish, LA | -0.9224 |
| Denver County, CO | -0.9151 |
| Franklin County, OH | -0.9128 |
| Ventura County, CA | -0.8896 |
| Harris County, TX | -0.8821 |
| Oklahoma County, OK | -0.8608 |
| Tarrant County, TX | -0.8218 |
| Volusia County, FL | -0.8002 |
| Travis County, TX | -0.7906 |
| El Paso County, CO | -0.6507 |
| Bernalillo County, NM | -0.6349 |
| Clark County, NV | -0.5893 |

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Table A1 – *Continued from previous page*

| County | Factor 1 |
|---|---|
| Caddo Parish, LA | -0.3353 |
| Lee County, FL | -0.3172 |
| Cobb County, GA | -0.2737 |
| Camden County, NJ | -0.1741 |
| Oakland County, MI | -0.1692 |
| Monterey County, CA | -0.1611 |
| Pima County, AZ | -0.1360 |
| DeKalb County, GA | 0.0228 |
| Hamilton County, OH | 0.0504 |
| Hartford County, CT | 0.0959 |
| San Francisco County, CA | 0.1597 |
| Montgomery County, MD | 0.1649 |
| Bexar County, TX | 0.1956 |
| Chatham County, GA | 0.3013 |
| New Castle County, DE | 0.3029 |
| Dallas County, TX | 0.3646 |
| Providence County, RI | 0.3697 |
| Anne Arundel County, MD | 0.4381 |
| Montgomery County, OH | 0.5203 |
| St. Louis city, MO | 0.5304 |
| NYC | 0.6332 |
| Fairfax County, VA | 0.6486 |
| Palm Beach County, FL | 0.6506 |

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Table A1 – *Continued from previous page*

| County | Factor 1 |
|---|---|
| Pinellas County, FL | 0.6741 |
| Salt Lake County, UT | 0.6756 |
| Mecklenburg County, NC | 0.6826 |
| Miami-Dade County, FL | 0.6909 |
| Richmond city, VA | 0.7492 |
| Baltimore County, MD | 0.8423 |
| Winnebago County, IL | 0.8838 |
| Kern County, CA | 1.0694 |
| Santa Clara County, CA | 1.1260 |
| Prince George's County, MD | 1.1410 |
| Hinds County, MS | 1.1675 |
| Broward County, FL | 1.1965 |
| Sedgwick County, KS | 1.2397 |
| Orange County, CA | 1.2552 |
| Passaic County, NJ | 1.3289 |
| Maricopa County, AZ | 1.3513 |
| Montgomery County, PA | 1.3766 |
| Solano County, CA | 1.3947 |
| Monroe County, NY | 1.4148 |
| Los Angeles County, CA | 1.4160 |
| Baltimore city, MD | 1.4715 |
| Jefferson Parish, LA | 1.4806 |
| District of Columbia, DC | 1.5930 |

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Table A1 – *Continued from previous page*

| County | Factor 1 |
|---|---|
| San Diego County, CA | 1.5979 |
| Mobile County, AL | 1.6046 |
| Contra Costa County, CA | 1.6330 |
| San Bernardino County, CA | 1.6456 |
| Richland County, SC | 1.6974 |
| Erie County, NY | 1.7022 |
| Riverside County, CA | 1.7879 |
| Wayne County, MI | 1.7980 |
| San Joaquin County, CA | 1.7999 |
| Bibb County, GA | 1.8719 |
| Cumberland County, NC | 1.8749 |
| Guilford County, NC | 1.9400 |
| Montgomery County, AL | 2.0026 |
| Alameda County, CA | 2.0417 |
| Hampden County, MA | 2.1212 |
| Stanislaus County, CA | 2.1215 |
| Cuyahoga County, OH | 2.1243 |
| King County, WA | 2.1889 |
| Wake County, NC | 2.2321 |
| Multnomah County, OR | 2.2546 |
| Lucas County, OH | 2.2970 |
| Fulton County, GA | 2.3186 |
| Fresno County, CA | 2.3500 |

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Table A1 – *Continued from previous page*

| County | Factor 1 |
|---|---|
| Nassau County, NY | 2.3619 |
| Kent County, MI | 2.3680 |
| Jackson County, MO | 2.3734 |
| Cook County, IL | 2.3963 |
| Washoe County, NV | 2.4940 |
| Westchester County, NY | 2.5988 |
| Genesee County, MI | 2.6115 |
| Milwaukee County, WI | 2.6195 |
| East Baton Rouge Parish, LA | 2.6344 |
| San Mateo County, CA | 2.7023 |
| Allegheny County, PA | 2.7847 |
| Jefferson County, AL | 2.9451 |
| Suffolk County, NY | 2.9620 |
| Delaware County, PA | 3.0513 |
| Essex County, NJ | 3.2056 |
| Pierce County, WA | 3.2543 |
| Hennepin County, MN | 3.4351 |
| Philadelphia County, PA | 3.6123 |

## A4.5 State-Level Handgun Check Factor Loadings

| State | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Iowa | -627.2668 | -232.0078 | 23.3048 | 17.6464 |
| Nebraska | -621.7008 | -189.7626 | -11.2814 | 22.2497 |
| New York | -448.5870 | -132.7421 | -62.2758 | -3.0756 |
| North Carolina | -441.2939 | -151.7821 | -42.1234 | -26.6060 |
| New Jersey | -343.4451 | -127.1018 | -55.0383 | -25.4617 |
| Maryland | -319.3066 | 192.1388 | -76.2961 | -67.8736 |
| Massachusetts | -313.0145 | -85.8170 | -74.2129 | 15.0483 |
| California | -271.4025 | -146.3080 | 68.0417 | 43.2913 |
| Minnesota | -234.7604 | 83.2687 | -46.0386 | 134.1555 |
| Rhode Island | -218.6878 | -53.8297 | -73.6623 | -87.7333 |
| Arizona | -194.1402 | -14.9635 | 12.2980 | -29.4000 |
| Kentucky | -180.5030 | -137.5989 | 232.4196 | 11.4725 |
| Hawaii | -170.2504 | -71.8413 | -146.6461 | -5.8560 |
| Utah | -159.2589 | 10.7289 | -169.7298 | -66.5886 |
| Montana | -157.9407 | 79.2344 | 150.2527 | -16.8185 |
| Georgia | -144.9380 | -24.8661 | -73.5652 | -2.4795 |
| Kansas | -104.1863 | 129.8377 | -1.8804 | -20.4769 |
| Texas | -83.0478 | 23.8170 | 26.8460 | 23.6109 |
| Louisiana | -82.5940 | -75.9248 | 92.3581 | 87.7107 |
| New Mexico | -55.8881 | -121.0172 | 166.6726 | -114.4099 |
| Michigan | -44.2869 | -133.0810 | -107.0615 | 40.2291 |
| District of Columbia | -39.9094 | -151.8201 | -88.8811 | -26.9508 |

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Table A2 – *Continued from previous page*

| State | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Nevada | -27.0839 | 176.5553 | -159.8685 | -37.4504 |
| North Dakota | -12.7402 | 281.9277 | -1.8346 | -6.0028 |
| **Missouri** | -6.0998 | -5.7038 | -41.8149 | 2.4117 |
| Idaho | 4.6001 | -2.3485 | -7.2327 | -113.6064 |
| Arkansas | 4.8625 | -22.3973 | 129.6759 | 10.5897 |
| Vermont | 12.1636 | -128.5200 | 94.2149 | -117.2728 |
| Ohio | 15.9978 | 144.1161 | 12.9536 | 91.9530 |
| Wyoming | 54.9571 | 171.9347 | 198.6705 | -8.2365 |
| Delaware | 55.1718 | -64.2073 | -6.6680 | 22.4293 |
| South Carolina | 61.1017 | -4.2202 | 59.4616 | -19.8293 |
| Maine | 66.4412 | -5.9581 | 89.5195 | 28.7165 |
| Alabama | 70.3486 | 266.2399 | 55.0297 | 481.6706 |
| Alaska | 88.4458 | 215.7023 | -3.8074 | -54.7818 |
| Washington | 149.0675 | 197.6864 | -195.0155 | -64.8590 |
| Illinois | 168.7285 | -63.2507 | -25.9867 | 11.2577 |
| Mississippi | 169.8055 | -227.6180 | 255.3865 | -46.6442 |
| Wisconsin | 188.0983 | 118.5966 | 58.5803 | -55.5824 |
| Connecticut | 219.1769 | -41.5477 | -225.4289 | 253.2733 |
| South Dakota | 263.0773 | 101.4312 | -23.6280 | 46.4948 |
| Virginia | 289.0819 | 83.7123 | -58.9746 | -87.2869 |
| Colorado | 292.2589 | 104.0512 | 212.2811 | -59.2297 |
| West Virginia | 297.3708 | 144.8954 | 214.3918 | 24.0013 |
| Oklahoma | 356.0568 | 280.5641 | 3.4317 | 59.5462 |

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Table A2 – *Continued from previous page*

| State | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Florida | 358.9205 | 124.4501 | -285.3072 | -121.7873 |
| New Hampshire | 450.9163 | 177.5086 | 37.4373 | -116.3708 |
| Oregon | 558.8304 | 148.7561 | -45.6305 | -107.0204 |
| Pennsylvania | 1106.8534 | -840.9179 | -83.3374 | 81.9327 |

## A4.6 City-Level Homicide Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Chester City, Pennsylvania | -12.5113 | 5.9700 | 8.7024 | -2.2506 |
| Wilmington City, Delaware | -11.3803 | 0.9288 | 0.0780 | -2.8108 |
| Petersburg City, Virginia | -5.3543 | 0.5269 | 2.8686 | 3.3371 |
| Harrisburg City, Pennsylvania | -5.3219 | 1.8433 | 1.4156 | 2.2033 |
| Trenton City, New Jersey | -5.1207 | 1.4705 | -2.6294 | -1.9741 |
| Plainfield City, New Jersey | -4.5517 | 1.9221 | -1.7514 | -1.9404 |
| Charleston City, South Carolina | -4.1842 | 1.8512 | -1.4654 | 0.1199 |
| Wilmington City, North Carolina | -3.7390 | -0.8147 | -0.6828 | 1.1934 |
| Paterson City, New Jersey | -3.4767 | -2.5166 | 0.1499 | 0.0468 |
| Tulsa City, Oklahoma | -3.3599 | 0.1656 | -0.7036 | -0.4547 |
| Springfield City, Massachusetts | -3.2151 | 0.9739 | -1.2684 | 0.5225 |
| Fairfield City, California | -3.1028 | 0.9803 | -0.7634 | -0.1091 |
| Jersey City City, New Jersey | -3.0067 | -0.6514 | -0.9248 | 0.4474 |
| Colorado Springs City, Colorado | -2.7594 | -0.2486 | -0.6015 | -0.2211 |
| Erie City, Pennsylvania | -2.7395 | 0.0832 | -0.6872 | 0.4902 |
| Baton Rouge City, Louisiana | -2.6707 | 1.5545 | 0.2553 | 2.1194 |
| Buffalo City, New York | -2.6179 | 3.0438 | -0.8755 | 1.8100 |
| Syracuse City, New York | -2.6159 | 0.6831 | -1.3291 | 0.7497 |
| Rialto City, California | -2.4022 | 1.3121 | -1.3382 | 1.2131 |
| Vallejo City, California | -2.3794 | 1.4748 | 0.2204 | -1.6754 |
| Lawton City, Oklahoma | -2.3719 | -1.1049 | 0.3382 | -0.6238 |
| San Jose City, California | -2.2531 | -1.0571 | -0.7381 | -0.2053 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Elizabeth City, New Jersey | -2.0998 | 1.5025 | -1.4277 | -0.5471 |
| Savannah City, Georgia | -2.0511 | -1.0398 | 0.1466 | 0.2000 |
| El Paso City, Texas | -2.0161 | 0.5816 | -0.9067 | 0.1646 |
| Tucson City, Arizona | -1.9991 | 0.7686 | -2.6273 | 0.9840 |
| Port Arthur City, Texas | -1.9891 | -0.9670 | -0.4857 | 1.3453 |
| Danville City, Virginia | -1.9693 | -0.6207 | 0.5384 | 1.9793 |
| Newark City, New Jersey | -1.9141 | -0.1842 | -0.4843 | -1.3384 |
| Corpus Christi City, Texas | -1.8812 | -2.7073 | 0.3666 | 0.5198 |
| Lafayette City, Louisiana | -1.8238 | -1.3101 | 0.8968 | 0.8424 |
| Berkeley City, California | -1.7571 | -0.0693 | -1.0950 | -0.5604 |
| Longview City, Texas | -1.6958 | -1.7582 | -0.0151 | -0.4613 |
| Atlantic City City, New Jersey | -1.6860 | 0.7741 | 1.4956 | -4.1787 |
| North Charleston City, South Carolina | -1.6818 | 0.8720 | 1.1227 | -0.1260 |
| Hayward City, California | -1.5916 | -0.5299 | -0.6903 | 0.5899 |
| Oklahoma City City, Oklahoma | -1.5629 | -1.2938 | -0.1993 | -0.4089 |
| Virginia Beach City, Virginia | -1.4095 | -0.4581 | -0.5200 | -0.7729 |
| Hampton City, Virginia | -1.3993 | -0.8179 | 0.0941 | -0.6063 |
| Hartford City, Connecticut | -1.3757 | 1.5441 | -2.1471 | 1.8079 |
| Newport News City, Virginia | -1.3584 | -0.5021 | -0.1441 | 0.5385 |
| Aurora City, Colorado | -1.3576 | -1.3679 | -1.0693 | -0.1669 |
| San Francisco City, California | -1.3181 | 0.0117 | -0.3886 | -0.4254 |
| Albuquerque City, New Mexico | -1.2649 | 0.6205 | -1.8855 | 0.1273 |
| Austin City, Texas | -1.2168 | -2.6087 | -0.7947 | -0.3299 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Flint City, Michigan | -1.2143 | 1.1393 | -0.4927 | -4.9286 |
| Carson City, California | -1.2056 | 0.7414 | -1.2850 | 1.1128 |
| Yonkers City, New York | -1.1861 | -0.2100 | -1.3384 | -0.1564 |
| Boston City, Massachusetts | -1.1783 | -0.2895 | 0.2033 | -0.9409 |
| Pittsburg City, California | -1.1185 | -2.2239 | -0.6572 | 1.0003 |
| Lubbock City, Texas | -0.8845 | -2.7821 | -0.6576 | 0.4637 |
| Texas City City, Texas | -0.8740 | 0.0349 | -1.8891 | 2.0951 |
| Bakersfield City, California | -0.8636 | -0.3637 | -0.8659 | 0.0312 |
| Providence City, Rhode Island | -0.8557 | 0.6444 | -2.2349 | 0.1323 |
| Lansing City, Michigan | -0.8340 | 0.0136 | -0.7208 | 0.2870 |
| Asheville City, North Carolina | -0.7759 | 0.9443 | 0.7325 | 0.0522 |
| Oakland City, California | -0.7740 | 2.6859 | 0.4882 | -2.0858 |
| Garland City, Texas | -0.7689 | -1.3471 | -0.2002 | -0.1447 |
| Baltimore City, Maryland | -0.7216 | 4.1784 | -0.5901 | 2.4525 |
| Palmdale City, California | -0.7097 | 0.8667 | -0.9743 | -0.0368 |
| Durham City, North Carolina | -0.6384 | 0.7579 | -1.1566 | 0.6123 |
| Amarillo City, Texas | -0.6290 | -1.5583 | -0.6802 | 0.3259 |
| Stockton City, California | -0.6219 | -0.1048 | 0.3966 | -1.0440 |
| Seattle City, Washington | -0.6035 | -1.0710 | -0.2653 | 0.1088 |
| Irving City, Texas | -0.4864 | -2.6664 | 0.0358 | -0.4236 |
| Pasadena City, California | -0.3876 | -1.3277 | 0.7412 | -0.0091 |
| San Diego City, California | -0.3464 | -0.0070 | -0.3849 | -0.7418 |
| Waterbury City, Connecticut | -0.2412 | -0.0181 | -0.0711 | 0.3903 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| St. Paul City, Minnesota | -0.2289 | -0.2394 | -0.9650 | 0.6380 |
| Riverside City, California | -0.2066 | 0.8298 | -0.7361 | 0.3629 |
| Killeen City, Texas | -0.1845 | -1.7487 | 2.2062 | -2.8616 |
| Gulfport City, Mississippi | -0.0630 | -1.3575 | -1.7378 | 1.3980 |
| Arlington City, Texas | -0.0254 | -2.2202 | -0.8264 | -0.9418 |
| Toledo City, Ohio | -0.0236 | -0.0092 | -0.1013 | 0.1514 |
| Goldsboro City, North Carolina | -0.0080 | -1.0464 | 2.0661 | -3.5488 |
| Greensboro City, North Carolina | 0.0137 | 0.9417 | -0.3786 | 0.1998 |
| Mount Vernon City, New York | 0.0960 | -1.6098 | -1.0172 | -0.9737 |
| Beaumont City, Texas | 0.1641 | -0.9573 | 1.5903 | 0.0656 |
| Albany City, New York | 0.1873 | -0.7325 | -1.4610 | 0.5406 |
| Columbus City, Ohio | 0.1918 | -0.4365 | -0.1436 | -0.0666 |
| Sumter City, South Carolina | 0.1947 | -1.5457 | -1.0781 | 0.5269 |
| Phoenix City, Arizona | 0.2067 | 1.2461 | -2.4794 | 1.2268 |
| Roanoke City, Virginia | 0.2284 | -2.0551 | -0.9711 | -1.1557 |
| Mesquite City, Texas | 0.3824 | -2.4464 | -0.4453 | -0.5267 |
| Denver City, Colorado | 0.3893 | -1.6377 | -0.0032 | 0.6273 |
| Tyler City, Texas | 0.4343 | -2.4386 | -0.5893 | 0.3688 |
| Meridian City, Mississippi | 0.4530 | -4.0241 | 1.1518 | 0.1279 |
| Sacramento City, California | 0.5069 | -0.8476 | -0.3981 | -0.2831 |
| Grand Rapids City, Michigan | 0.5361 | -0.7846 | -0.3697 | 0.2250 |
| Portland City, Oregon | 0.5542 | -0.9950 | -0.2233 | -0.2043 |
| Ontario City, California | 0.5849 | -0.4292 | 0.4816 | -0.0486 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Dayton City, Ohio | 0.6111 | -0.0008 | 0.6469 | 0.5876 |
| Lima City, Ohio | 0.6319 | -0.2162 | -1.2577 | -0.4999 |
| Fontana City, California | 0.6935 | 0.0946 | -0.1501 | 1.1543 |
| Little Rock City, Arkansas | 0.6965 | 1.1816 | 2.0394 | 0.3722 |
| Pomona City, California | 0.7662 | 1.9515 | -0.5786 | -0.5955 |
| Tacoma City, Washington | 0.8194 | 0.9519 | -0.3223 | -0.1188 |
| Columbia City, South Carolina | 0.8796 | -0.6088 | -0.1049 | 0.6507 |
| Grand Prairie City, Texas | 0.8842 | -2.1863 | -0.5700 | 0.3422 |
| Fresno City, California | 0.9389 | 0.8027 | 0.2758 | 0.5765 |
| Philadelphia City, Pennsylvania | 1.0106 | 2.3428 | -0.8381 | 0.3485 |
| Alexandria City, Louisiana | 1.0527 | -3.6547 | 3.2891 | 2.3448 |
| Pine Bluff City, Arkansas | 1.0579 | 2.0029 | 0.6413 | 4.4326 |
| Rochester City, New York | 1.1408 | 2.2074 | -1.0280 | 0.7262 |
| **St. Louis City, Missouri** | 1.1663 | 2.3358 | 8.1607 | 1.7983 |
| Norfolk City, Virginia | 1.2187 | 2.1937 | 0.3219 | -0.1954 |
| Saginaw City, Michigan | 1.2376 | 1.6231 | -1.8867 | -4.5702 |
| Fayetteville City, North Carolina | 1.2629 | 0.9695 | 1.0132 | -2.1628 |
| High Point City, North Carolina | 1.3561 | -0.2144 | 0.5138 | 2.2363 |
| Wichita Falls City, Texas | 1.4181 | -2.6751 | -0.8563 | -1.3876 |
| Winston-Salem City, North Carolina | 1.4265 | 0.9102 | 0.4089 | 0.6214 |
| Suffolk City, Virginia | 1.5234 | 1.3949 | -0.4866 | -2.6615 |
| Las Vegas City, Nevada | 1.5248 | -3.4174 | 1.0197 | 2.6543 |
| San Antonio City, Texas | 1.5522 | -2.4407 | 1.3287 | -0.9197 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| East Orange City, New Jersey | 1.5920 | -1.1642 | -3.9716 | 1.8669 |
| Portsmouth City, Virginia | 1.6986 | 1.1680 | 1.3830 | 0.9910 |
| Waco City, Texas | 1.7221 | 0.6965 | -0.2515 | 0.1041 |
| Greenville City, South Carolina | 1.7233 | -2.3642 | -0.1920 | 0.0048 |
| Vicksburg City, Mississippi | 1.8426 | 0.3808 | 0.7083 | 2.7660 |
| Rocky Mount City, North Carolina | 1.9671 | 1.5066 | 1.6327 | 0.2806 |
| Richmond City, California | 2.1423 | 8.0385 | 0.1314 | -1.0181 |
| **Kansas City City, Missouri** | 2.1464 | 0.1922 | -0.0050 | -0.0409 |
| Spartanburg City, South Carolina | 2.2839 | 1.7531 | -0.9224 | -1.2562 |
| Long Beach City, California | 2.3224 | 0.1734 | 0.5934 | 0.0380 |
| Jackson City, Mississippi | 2.4149 | 1.7110 | 2.7233 | 1.8376 |
| Charlotte City, North Carolina | 2.7564 | -0.0343 | 1.1224 | -0.6010 |
| North Little Rock City, Arkansas | 2.7617 | 1.6667 | -0.3644 | -1.0161 |
| San Bernardino City, California | 2.8548 | 3.1617 | 2.7175 | 0.4117 |
| Cleveland City, Ohio | 2.9654 | -3.0665 | 3.1460 | -0.3220 |
| New York City, New York | 3.3617 | -1.7048 | 1.5739 | -1.0755 |
| Gastonia City, North Carolina | 3.4016 | 0.1388 | 0.3201 | 2.0168 |
| Shreveport City, Louisiana | 3.5979 | 0.3098 | 2.0088 | 1.9318 |
| Los Angeles City, California | 3.7090 | -0.9961 | 0.5380 | -0.1139 |
| Valdosta City, Georgia | 4.1432 | -1.2733 | 0.3898 | -1.4290 |
| Albany City, Georgia | 4.6203 | -2.2343 | 2.5055 | 0.3376 |
| Fort Worth City, Texas | 4.7399 | -3.7606 | 2.7121 | -1.3680 |
| Inglewood City, California | 4.8686 | 2.5268 | -0.8951 | -0.7020 |

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Table A3 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Dallas City, Texas | 5.4436 | -2.5997 | 1.3148 | -2.1315 |
| Detroit City, Michigan | 5.4645 | -1.9963 | 0.4824 | -2.5454 |
| Atlanta City, Georgia | 6.9432 | 0.1764 | 0.0253 | 0.0505 |
| Bridgeport City, Connecticut | 7.3015 | -0.5479 | 2.6776 | -0.6432 |
| Richmond City, Virginia | 11.0510 | 4.7328 | -0.7156 | 3.2660 |
| Compton City, California | 16.3787 | 5.5363 | -2.7231 | -2.9400 |

### A4.7 City-Level Black Homicide Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Richmond City, Virginia | -15.4222 | -6.9937 | 3.7730 | 2.3787 | -1.2794 |
| Fort Worth City, Texas | -13.9780 | 2.3486 | -5.6197 | -1.9669 | 4.8728 |
| Los Angeles City, California | -13.5589 | 1.9793 | -1.4404 | -1.8883 | 2.7430 |
| Bridgeport City, Connecticut | -13.1803 | -0.8981 | -0.9117 | -1.5042 | 0.6987 |
| Amarillo City, Texas | -12.4029 | 5.5631 | 2.3133 | 14.1977 | -4.8289 |
| Dallas City, Texas | -10.4162 | 3.1602 | -3.0646 | -4.8324 | 2.4935 |
| Compton City, California | -9.8161 | -12.2554 | 7.6840 | -6.0277 | -1.2831 |
| Portland City, Oregon | -9.5354 | -0.9491 | 1.0715 | 3.3614 | -0.1136 |
| Tacoma City, Washington | -8.7375 | -2.3196 | -0.2998 | 1.2572 | 2.6255 |
| Atlanta City, Georgia | -8.4588 | -1.0124 | 2.8134 | -2.1194 | -0.5208 |
| New York City, New York | -8.1130 | 2.2960 | -1.5407 | -1.7816 | 2.5210 |
| Charlotte City, North Carolina | -7.4659 | -0.9217 | -2.6978 | -1.3346 | -0.3418 |
| North Little Rock City, Arkansas | -7.4496 | -7.4518 | 3.6764 | -0.3989 | 1.8561 |
| Fontana City, California | -7.4492 | -0.5071 | 0.0146 | 1.4766 | -6.5575 |
| Detroit City, Michigan | -7.0820 | 4.3931 | 0.7433 | -2.6120 | 4.2689 |
| **St. Louis City, Missouri** | -6.8982 | -0.4530 | -10.4999 | 6.1272 | -3.3030 |
| Waco City, Texas | -6.7362 | -2.8058 | -0.4133 | 1.5542 | 0.7038 |
| Shreveport City, Louisiana | -6.7230 | 0.6088 | -0.8357 | 0.5971 | -5.2185 |
| Greenville City, South Carolina | -6.6538 | 5.9979 | 2.1908 | -0.5955 | 4.3487 |
| Phoenix City, Arizona | -6.5420 | -6.6941 | 4.9685 | 4.4844 | -3.9433 |
| Ontario City, California | -6.3793 | -6.1572 | -7.1456 | 2.4929 | 1.1590 |
| Long Beach City, California | -6.0946 | -0.4500 | -1.5446 | -1.5650 | -1.9785 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Cleveland City, Ohio | -6.0936 | 6.8872 | -4.2327 | -0.9413 | -2.0438 |
| Gastonia City, North Carolina | -5.9974 | -0.2836 | 2.1820 | 2.0919 | 4.1758 |
| Winston-Salem City, North Carolina | -5.4876 | 0.4357 | 0.4001 | -0.0414 | 0.7742 |
| San Antonio City, Texas | -5.4561 | 1.1466 | -4.6232 | 2.0727 | 0.2199 |
| Albany City, Georgia | -5.4039 | 4.2085 | 1.1006 | 1.1613 | 3.7165 |
| Wichita Falls City, Texas | -5.3570 | 5.0654 | 4.0700 | -8.8744 | 3.7855 |
| Pasadena City, California | -5.1352 | 5.3706 | -3.2796 | 1.5070 | 0.8191 |
| Grand Rapids City, Michigan | -5.0834 | 3.8143 | -0.1023 | 2.1209 | -3.2333 |
| Inglewood City, California | -4.8116 | -4.6262 | 3.0963 | -4.6861 | -2.0198 |
| Grand Prairie City, Texas | -4.7835 | -2.2929 | 1.7777 | -2.1825 | 2.3955 |
| Spartanburg City, South Carolina | -4.5899 | -4.6707 | 2.3492 | -3.3190 | -2.0340 |
| Lubbock City, Texas | -4.5867 | 8.5429 | -1.5293 | 4.2822 | 0.7003 |
| Valdosta City, Georgia | -4.2258 | 2.3995 | -0.2990 | -2.8160 | 6.0052 |
| Suffolk City, Virginia | -3.8280 | -1.2808 | -1.7433 | -3.2674 | 0.7695 |
| Waterbury City, Connecticut | -3.6952 | -1.4816 | -0.8781 | 3.9927 | 0.0275 |
| **Kansas City City, Missouri** | -3.5502 | -2.8601 | -0.9401 | 0.3541 | 1.5762 |
| Rochester City, New York | -3.4412 | -6.0515 | -0.5141 | 1.3731 | -0.7967 |
| High Point City, North Carolina | -3.3912 | -1.8737 | 2.8363 | 2.7945 | -0.9491 |
| Portsmouth City, Virginia | -3.3675 | -1.2642 | -1.0029 | 2.6854 | 3.1570 |
| Lima City, Ohio | -3.2800 | -0.0954 | -1.4868 | -5.3043 | -9.3721 |
| Tyler City, Texas | -3.2062 | 5.6695 | 0.3491 | 0.2529 | -3.3397 |
| Vicksburg City, Mississippi | -2.8742 | 2.1791 | 3.8028 | 1.3677 | 1.0991 |
| St. Paul City, Minnesota | -2.4379 | 0.3640 | 2.5107 | 0.1084 | -0.3194 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Seattle City, Washington | -2.3904 | 0.8309 | 0.0426 | 3.5468 | 2.8264 |
| Riverside City, California | -2.3794 | -4.2487 | -1.2788 | 1.0173 | 2.1597 |
| Jackson City, Mississippi | -2.1621 | -1.5132 | -0.0974 | 4.3194 | -1.6303 |
| Alexandria City, Louisiana | -2.1391 | 6.9970 | -5.0098 | 0.6572 | -1.4290 |
| Little Rock City, Arkansas | -2.1210 | -2.7400 | -4.4433 | 1.4173 | 1.0987 |
| Columbus City, Ohio | -2.1006 | -0.3487 | -1.2829 | -0.1323 | -0.8735 |
| San Bernardino City, California | -2.0234 | -10.3038 | -17.8795 | -0.1933 | -7.5695 |
| Roanoke City, Virginia | -1.9187 | 0.5468 | 3.5361 | -7.8338 | -2.3335 |
| Norfolk City, Virginia | -1.7061 | -4.4145 | -1.7080 | -1.7128 | 1.6189 |
| Las Vegas City, Nevada | -1.6175 | -4.0134 | 3.6485 | 0.8758 | -12.8867 |
| Albuquerque City, New Mexico | -1.4576 | -2.1693 | 0.8580 | 1.3987 | 4.9033 |
| Saginaw City, Michigan | -1.4519 | -1.7955 | -7.1090 | -8.4485 | -0.5214 |
| Philadelphia City, Pennsylvania | -1.2654 | -2.7821 | 1.1788 | -1.7619 | -2.9577 |
| Denver City, Colorado | -1.1871 | 2.0150 | 0.9417 | 2.1742 | 0.9083 |
| Columbia City, South Carolina | -1.1476 | 1.6140 | 1.1734 | 0.6259 | -2.1766 |
| Pomona City, California | -1.0803 | -7.5380 | -1.0662 | 10.5716 | 10.7124 |
| Corpus Christi City, Texas | -1.0173 | 9.7411 | -2.5038 | -5.0183 | -7.6428 |
| Rocky Mount City, North Carolina | -0.9511 | -1.2759 | 0.6328 | 0.5667 | -1.5747 |
| Garland City, Texas | -0.7842 | 1.9819 | -1.8919 | 1.0741 | 2.7274 |
| Durham City, North Carolina | -0.7567 | -1.1259 | 2.3229 | 0.5895 | -0.5176 |
| Austin City, Texas | -0.7219 | 6.1814 | 0.1083 | -1.2334 | 1.1877 |
| Toledo City, Ohio | -0.7044 | 2.4141 | -3.3779 | -1.0425 | -2.3057 |
| Irving City, Texas | -0.4146 | 6.4755 | -0.3514 | -1.5935 | -0.3290 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Sacramento City, California | -0.3004 | 1.2189 | -1.2887 | 0.1816 | 2.2767 |
| San Diego City, California | -0.2411 | -0.2890 | 0.3108 | -0.5590 | 3.4061 |
| Texas City City, Texas | -0.1388 | 0.8049 | 4.4355 | 2.8691 | -0.9761 |
| Flint City, Michigan | -0.1081 | 2.6479 | -2.8383 | -6.1617 | 3.9881 |
| East Orange City, New Jersey | 0.1153 | 0.6165 | 4.9102 | -2.0944 | -0.4084 |
| Dayton City, Ohio | 0.1378 | 1.5106 | -1.4765 | 0.1282 | -1.1454 |
| Lansing City, Michigan | 0.4785 | 1.6923 | 2.5299 | -1.8984 | -2.1793 |
| Killeen City, Texas | 0.5894 | 3.7087 | -1.0464 | -0.0184 | -2.0143 |
| Fayetteville City, North Carolina | 0.5989 | -2.2810 | 0.0192 | -2.4909 | 1.0129 |
| Greensboro City, North Carolina | 0.7290 | -1.9373 | 1.3180 | 0.3427 | 0.1034 |
| Richmond City, California | 0.8533 | -18.7366 | -2.4356 | 0.9963 | 0.9831 |
| Albany City, New York | 0.9957 | -0.1616 | 6.3933 | 1.4737 | -0.0140 |
| Fresno City, California | 1.2055 | -7.1397 | -2.6101 | -2.2011 | 5.8415 |
| Pittsburg City, California | 1.2690 | 14.2829 | -0.3706 | -0.8494 | 5.3770 |
| Beaumont City, Texas | 1.3632 | 2.8277 | -1.5082 | 1.7835 | -0.3009 |
| Lafayette City, Louisiana | 1.3957 | 3.3133 | -2.0123 | 3.4558 | 1.1537 |
| Hayward City, California | 1.4091 | -2.9643 | 3.7116 | 1.4854 | -3.8004 |
| Meridian City, Mississippi | 1.4385 | 8.3569 | -1.2576 | 1.9449 | -1.6266 |
| Baltimore City, Maryland | 1.5222 | -4.1658 | 1.0164 | 1.1810 | -1.7571 |
| Berkeley City, California | 1.5737 | -2.3105 | 2.0709 | -1.4639 | 5.6741 |
| Arlington City, Texas | 1.5894 | 4.2822 | 0.2828 | 0.8525 | -2.9721 |
| Palmdale City, California | 1.7192 | -2.2165 | -0.8523 | -1.0577 | 3.9271 |
| Boston City, Massachusetts | 1.8568 | -1.9883 | -1.4670 | -2.4149 | -0.8193 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Yonkers City, New York | 1.9551 | 1.8856 | 2.1253 | -1.0782 | -1.1156 |
| Gulfport City, Mississippi | 2.1591 | 0.5402 | 5.7360 | 0.0628 | 0.1105 |
| Providence City, Rhode Island | 2.3784 | -2.2641 | 7.7544 | -9.1564 | -2.9283 |
| Sumter City, South Carolina | 2.4451 | 3.4269 | 2.5303 | -2.6803 | 2.3208 |
| Asheville City, North Carolina | 2.4894 | 1.8419 | 3.1961 | 1.7247 | -5.3301 |
| Pine Bluff City, Arkansas | 2.6571 | -2.6601 | 4.0398 | 3.9272 | -4.1212 |
| Aurora City, Colorado | 2.7883 | 3.7017 | 1.8319 | 0.3298 | 1.5770 |
| Oklahoma City City, Oklahoma | 3.0621 | 1.7353 | -1.0530 | -0.9111 | -0.4349 |
| Port Arthur City, Texas | 3.0655 | 3.7887 | -0.2314 | 0.0269 | 1.3813 |
| Mount Vernon City, New York | 3.0790 | 1.8685 | 3.7601 | -2.4357 | -0.4947 |
| Goldsboro City, North Carolina | 3.4685 | 1.1782 | -3.4189 | -4.2213 | -2.7734 |
| Stockton City, California | 3.5154 | 5.3487 | -7.1234 | -4.3911 | -2.8682 |
| Savannah City, Georgia | 3.5335 | 4.6575 | 1.2648 | -0.5251 | -1.7118 |
| El Paso City, Texas | 3.6736 | -1.0321 | -0.6833 | -1.0957 | 0.2994 |
| Mesquite City, Texas | 3.7379 | 6.2735 | 3.5983 | -0.7277 | 4.0833 |
| Virginia Beach City, Virginia | 3.8894 | -0.6845 | 0.5564 | 0.4227 | 1.0314 |
| Newport News City, Virginia | 4.0205 | 1.7785 | 0.7202 | 0.8891 | -0.6455 |
| Longview City, Texas | 4.2254 | 1.9715 | -4.1851 | 1.0878 | 2.3454 |
| Paterson City, New Jersey | 4.6075 | 4.9493 | -0.1707 | -0.8797 | -1.5038 |
| Carson City, California | 4.6150 | -0.0044 | 4.0171 | 1.7991 | 0.2850 |
| Danville City, Virginia | 4.6355 | 1.0211 | 2.6731 | 3.2994 | -0.5380 |
| Lawton City, Oklahoma | 4.8467 | 7.2997 | 0.5641 | 1.3462 | 2.3073 |
| Plainfield City, New Jersey | 4.9515 | -0.2836 | 1.5927 | -2.8568 | -0.2438 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Hampton City, Virginia | 4.9700 | 1.0059 | 0.5817 | -0.8758 | -0.1638 |
| Vallejo City, California | 5.0326 | -0.7615 | 0.9800 | 1.1374 | 1.3378 |
| San Jose City, California | 5.0365 | 3.2600 | 2.2855 | 0.5509 | -1.2189 |
| Bakersfield City, California | 5.0507 | -6.4581 | 0.3873 | 0.0134 | 1.3146 |
| Newark City, New Jersey | 5.1244 | -0.4729 | -0.5254 | -2.4936 | 0.8929 |
| Elizabeth City, New Jersey | 5.3468 | -6.1695 | -1.5874 | -2.7947 | 3.0641 |
| Rialto City, California | 5.3817 | -6.2877 | 3.5028 | 1.4137 | -2.1747 |
| Colorado Springs City, Colorado | 5.5690 | 0.5048 | 2.9201 | 1.6061 | 4.3010 |
| Baton Rouge City, Louisiana | 5.9081 | -1.6374 | 0.5510 | 2.6772 | -2.9471 |
| North Charleston City, South Carolina | 6.1607 | 3.3355 | -1.9283 | -1.8503 | 0.2945 |
| Oakland City, California | 6.1941 | -6.2267 | -3.4801 | -1.4887 | 4.1905 |
| Buffalo City, New York | 6.2435 | -5.6600 | 0.0382 | 3.7101 | -0.6526 |
| Hartford City, Connecticut | 6.2488 | -1.9913 | 6.3021 | 2.4922 | -1.7929 |
| Springfield City, Massachusetts | 6.2810 | -2.7701 | 0.8540 | 1.0031 | 0.0337 |
| Jersey City City, New Jersey | 6.3822 | 2.9494 | 2.0062 | 1.0657 | -1.0571 |
| Charleston City, South Carolina | 6.4132 | -2.2554 | 0.6988 | 0.6854 | -1.2742 |
| Petersburg City, Virginia | 6.9051 | -0.0009 | -1.0922 | 4.2793 | -0.7002 |
| Tucson City, Arizona | 7.3122 | -2.1424 | 7.7081 | 0.9551 | 1.1716 |
| Atlantic City City, New Jersey | 9.1906 | 0.5391 | -3.7281 | -5.7203 | -4.9410 |
| Wilmington City, North Carolina | 9.3118 | 4.9035 | -0.2262 | 3.3954 | 1.7051 |
| Fairfield City, California | 9.7772 | -2.3468 | -3.1945 | 0.6818 | 2.5881 |
| Tulsa City, Oklahoma | 9.9045 | -0.2963 | -0.5411 | -1.4166 | -2.6656 |
| Erie City, Pennsylvania | 10.1927 | 4.4706 | 2.6944 | 6.0647 | -1.1618 |

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Table A4 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Harrisburg City, Pennsylvania | 10.2230 | 0.2258 | -0.0350 | 3.0505 | -0.0744 |
| Trenton City, New Jersey | 10.4431 | -1.0151 | 0.6382 | -3.4517 | 3.8352 |
| Syracuse City, New York | 10.8995 | -0.8884 | 0.2628 | 0.2455 | -0.1075 |
| San Francisco City, California | 13.5288 | -12.5313 | -3.1767 | -4.5043 | 2.6186 |
| Chester City, Pennsylvania | 16.5989 | -0.6090 | -10.9514 | 5.5661 | -0.0282 |
| Wilmington City, Delaware | 17.1927 | 1.6073 | -2.3957 | -1.3368 | -0.5805 |

### A4.8 City-Level Firearm Homicide Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Compton City, California | -12.9112 | -7.4657 | -2.6349 | -1.9406 | -3.5067 |
| Richmond City, Virginia | -10.0010 | -4.9203 | -0.0202 | 1.5867 | -2.0897 |
| Bridgeport City, Connecticut | -6.0940 | 0.6742 | 2.5547 | -0.8550 | 0.8524 |
| Inglewood City, California | -5.0152 | -3.5792 | 0.4713 | -1.0734 | 0.1072 |
| Dallas City, Texas | -4.8114 | 1.2631 | 1.4069 | -2.0478 | -0.0122 |
| Atlanta City, Georgia | -4.4749 | -0.3296 | -0.1747 | 0.0358 | -0.2577 |
| Shreveport City, Louisiana | -3.6882 | -0.2598 | 1.7341 | 1.7610 | -0.6374 |
| Albany City, Georgia | -3.6204 | 2.4773 | 2.3158 | 0.7359 | -1.4866 |
| Cleveland City, Ohio | -3.5369 | 3.4680 | 3.0290 | 0.0482 | -0.9941 |
| Fort Worth City, Texas | -3.4685 | 3.4072 | 2.0113 | -1.1371 | 0.0864 |
| Los Angeles City, California | -3.3928 | -0.3528 | 0.1182 | -0.4024 | 0.2267 |
| New York City, New York | -3.2519 | 1.3157 | 1.5401 | -1.3145 | 0.0921 |
| Gastonia City, North Carolina | -2.5690 | 0.4236 | -0.0201 | 0.9602 | 0.2544 |
| Detroit City, Michigan | -2.5665 | -0.0014 | 0.1887 | -1.6874 | 0.5554 |
| Spartanburg City, South Carolina | -2.4800 | -1.3098 | 0.0415 | -0.3358 | 1.0379 |
| Greenville City, South Carolina | -2.2155 | 2.0065 | -0.1719 | -0.1509 | -0.0034 |
| Charlotte City, North Carolina | -2.1719 | 0.4950 | 0.6818 | -0.4322 | 0.3940 |
| Portsmouth City, Virginia | -2.1624 | -0.0239 | 2.2572 | 0.8839 | 0.4262 |
| Valdosta City, Georgia | -1.9959 | 1.9363 | 0.6131 | -1.5104 | -0.5221 |
| North Little Rock City, Arkansas | -1.9265 | -1.3788 | 0.1296 | -1.2171 | 1.0306 |
| Long Beach City, California | -1.8650 | -0.7328 | 0.6439 | -0.0191 | 0.3798 |
| Richmond City, California | -1.8300 | -7.8436 | 1.7142 | -0.4218 | 3.6233 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| East Orange City, New Jersey | -1.7976 | -0.4108 | -3.4964 | 0.6653 | 0.3836 |
| Lima City, Ohio | -1.7482 | 0.3369 | -0.6816 | -0.6250 | -0.6361 |
| Wichita Falls City, Texas | -1.6598 | 1.7861 | -0.8677 | -0.7296 | 0.0670 |
| San Bernardino City, California | -1.6479 | -2.9265 | 2.0624 | 0.1273 | -1.1672 |
| High Point City, North Carolina | -1.4896 | 1.6382 | 0.4746 | 1.6074 | -0.3325 |
| San Antonio City, Texas | -1.3616 | 1.8834 | 1.1632 | -0.6972 | -0.0663 |
| Las Vegas City, Nevada | -1.3055 | 1.3114 | -0.2610 | 1.9521 | 0.1688 |
| Waco City, Texas | -1.2861 | -0.2894 | -0.0152 | -0.3036 | 0.1536 |
| Jackson City, Mississippi | -1.2526 | -1.2298 | 1.8884 | 2.4593 | -1.2681 |
| Grand Prairie City, Texas | -1.2182 | 2.3520 | -0.7356 | -0.1076 | 0.2333 |
| Ontario City, California | -1.2073 | 0.6188 | -0.1047 | -0.0630 | -0.0484 |
| Phoenix City, Arizona | -1.1477 | -1.0321 | -1.8888 | 0.8093 | 0.3194 |
| Philadelphia City, Pennsylvania | -1.1334 | -2.4028 | -0.4283 | 0.4622 | 1.1167 |
| Rochester City, New York | -1.1104 | -1.4048 | -1.4520 | 0.1997 | 0.3988 |
| Columbia City, South Carolina | -1.0246 | 0.3990 | -0.5848 | 0.4877 | 0.3366 |
| Pomona City, California | -1.0134 | -1.8838 | -0.5619 | -0.5434 | -0.3055 |
| Vicksburg City, Mississippi | -0.9650 | 0.9794 | 1.7142 | 1.2083 | 0.9777 |
| Fontana City, California | -0.9617 | -0.0540 | -0.3382 | 0.7042 | 0.7431 |
| Fresno City, California | -0.9579 | -0.7794 | 0.2041 | 0.2165 | 0.2741 |
| Killeen City, Texas | -0.9049 | 1.6927 | 2.0936 | -2.5320 | 1.2266 |
| Portland City, Oregon | -0.9039 | 1.0007 | -0.5700 | 0.1820 | -0.2463 |
| Roanoke City, Virginia | -0.7771 | 1.7892 | -0.5323 | -0.3125 | -0.1161 |
| Winston-Salem City, North Carolina | -0.7722 | -0.5413 | -0.2872 | 0.6935 | 0.1537 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Little Rock City, Arkansas | -0.7503 | -0.9410 | 1.7693 | -0.1277 | -0.3582 |
| Pasadena City, California | -0.7235 | 0.6305 | 0.8915 | -0.0197 | -0.1269 |
| Tacoma City, Washington | -0.6885 | -0.3665 | -0.0935 | -0.2198 | -0.2324 |
| Norfolk City, Virginia | -0.6416 | -1.8389 | 1.3999 | -0.4592 | -0.0758 |
| Toledo City, Ohio | -0.5957 | 0.8511 | 0.2069 | -0.0049 | -0.1630 |
| **Kansas City City, Missouri** | -0.5866 | -0.1752 | -0.3528 | 0.1018 | -0.9100 |
| Beaumont City, Texas | -0.5782 | 1.7030 | 0.6952 | -0.5439 | -0.4147 |
| Texas City City, Texas | -0.5597 | 0.4901 | -0.7013 | 0.7809 | 1.8777 |
| Sumter City, South Carolina | -0.5091 | 0.0495 | 0.3954 | -0.0400 | -0.0047 |
| Grand Rapids City, Michigan | -0.4976 | 0.8716 | -0.6462 | -0.1241 | 0.6359 |
| Fayetteville City, North Carolina | -0.4660 | -0.7990 | 0.5524 | -1.3235 | 0.5667 |
| Waterbury City, Connecticut | -0.4500 | 0.4746 | -0.2003 | 0.2013 | -0.3552 |
| Mesquite City, Texas | -0.4302 | 2.1326 | -0.6979 | -0.3435 | -0.1701 |
| Carson City, California | -0.4150 | -1.1959 | -1.3723 | 0.8741 | 0.6751 |
| Columbus City, Ohio | -0.4119 | 0.4168 | 0.0540 | -0.2624 | 0.0180 |
| Tyler City, Texas | -0.3890 | 1.5125 | -0.5558 | 0.1108 | -0.2726 |
| Denver City, Colorado | -0.3642 | 1.2052 | -0.3597 | 0.4551 | -0.1611 |
| Rocky Mount City, North Carolina | -0.3039 | -0.2247 | 1.2328 | 1.8052 | 1.1891 |
| Sacramento City, California | -0.2948 | 0.2934 | -0.3373 | -0.3861 | 0.0538 |
| Irving City, Texas | -0.1774 | 2.6026 | -0.1520 | -0.3643 | -0.0068 |
| Alexandria City, Louisiana | -0.1479 | 3.5620 | 2.2240 | 0.5634 | -2.5720 |
| Suffolk City, Virginia | -0.1421 | -0.4402 | -0.6891 | -1.0801 | -0.0129 |
| Asheville City, North Carolina | -0.1010 | 1.1065 | 0.3034 | 0.4505 | -0.5340 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Greensboro City, North Carolina | -0.0354 | -0.3845 | 0.2867 | 0.6391 | -0.4109 |
| Arlington City, Texas | 0.0242 | 1.4830 | -0.8771 | -0.4946 | 0.1488 |
| Lubbock City, Texas | 0.0450 | 2.7828 | -0.6072 | 0.3531 | -0.2626 |
| Riverside City, California | 0.0521 | -0.1534 | -0.8926 | 0.4534 | 0.4374 |
| Palmdale City, California | 0.0524 | -0.3161 | -0.5126 | -0.3480 | 0.5724 |
| Pine Bluff City, Arkansas | 0.0643 | -0.6062 | 0.2680 | 2.8191 | -0.5915 |
| Durham City, North Carolina | 0.1001 | -0.7162 | -1.2253 | 0.8720 | -0.0718 |
| Amarillo City, Texas | 0.1006 | 1.5539 | -0.4851 | 0.2485 | 0.0165 |
| San Diego City, California | 0.1306 | 0.0588 | -0.4055 | -0.5095 | -0.0301 |
| Dayton City, Ohio | 0.1384 | -0.0109 | 2.3916 | -0.3250 | 0.2013 |
| Lansing City, Michigan | 0.1647 | 0.6342 | -0.5949 | 0.0680 | -0.2022 |
| Austin City, Texas | 0.1811 | 2.1980 | -0.7887 | -0.2405 | 0.0977 |
| Gulfport City, Mississippi | 0.1836 | 0.6894 | -1.7182 | 0.9131 | 0.9480 |
| Mount Vernon City, New York | 0.2100 | 1.5055 | 0.0295 | -0.6153 | 0.7773 |
| Providence City, Rhode Island | 0.2494 | -0.9640 | -2.0987 | 0.2511 | 0.0918 |
| Albany City, New York | 0.2778 | 0.4597 | -1.4851 | 0.9496 | -0.0462 |
| Garland City, Texas | 0.2803 | 1.6311 | -0.3869 | 0.0994 | -0.0589 |
| St. Paul City, Minnesota | 0.2887 | 0.8718 | -0.5195 | 0.4255 | 0.0126 |
| Saginaw City, Michigan | 0.3217 | -1.1321 | -2.1175 | -3.4202 | -1.4732 |
| Seattle City, Washington | 0.3435 | 0.9126 | -0.2012 | -0.1810 | -0.3407 |
| Pittsburg City, California | 0.3793 | 0.1249 | -0.2147 | 0.1460 | -0.1930 |
| Hayward City, California | 0.4485 | 0.2446 | -1.4428 | 0.6954 | 0.0579 |
| Bakersfield City, California | 0.4673 | -0.5415 | -0.7365 | -0.0546 | -0.1542 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Tucson City, Arizona | 0.5204 | -0.4863 | -1.7862 | 0.6172 | 0.8152 |
| Meridian City, Mississippi | 0.5828 | 2.9621 | 0.2539 | -0.7162 | -2.0369 |
| Albuquerque City, New Mexico | 0.7430 | 0.1802 | -0.9868 | 0.4667 | -0.1813 |
| Yonkers City, New York | 0.8215 | 0.2983 | -1.0523 | -0.2115 | 0.3183 |
| Rialto City, California | 0.8327 | -1.3867 | -0.6893 | 0.2366 | 0.4541 |
| **St. Louis City, Missouri** | 0.8815 | -1.7902 | 5.9843 | 0.7448 | 2.3470 |
| Baltimore City, Maryland | 0.8885 | -3.9506 | 0.1644 | 2.9276 | -0.1374 |
| Stockton City, California | 0.8944 | -1.3729 | 0.0781 | -0.5429 | -0.1731 |
| Corpus Christi City, Texas | 0.9064 | 2.5678 | -0.0925 | 0.2246 | -0.9789 |
| Erie City, Pennsylvania | 0.9348 | 1.3173 | -0.6420 | 0.3838 | -0.4890 |
| Lawton City, Oklahoma | 0.9531 | 1.1525 | 0.1517 | -0.7745 | -0.1965 |
| Oklahoma City City, Oklahoma | 0.9557 | 1.0108 | -0.2678 | -0.3411 | 0.2023 |
| Virginia Beach City, Virginia | 1.0370 | 0.2177 | -0.6161 | -0.4556 | -0.0514 |
| Aurora City, Colorado | 1.0422 | 0.8516 | -1.1074 | 0.2245 | 0.0255 |
| Longview City, Texas | 1.1055 | 1.0326 | 0.1005 | -0.2788 | 0.8055 |
| Newport News City, Virginia | 1.1277 | 0.3989 | -0.2575 | 0.5081 | 0.2404 |
| San Francisco City, California | 1.1349 | -0.5333 | -0.3226 | -0.2988 | 0.1422 |
| Savannah City, Georgia | 1.2309 | 0.7035 | -0.4936 | 0.5114 | -0.7129 |
| El Paso City, Texas | 1.2551 | -0.3171 | -0.8185 | -0.1315 | 0.0162 |
| Danville City, Virginia | 1.3091 | 0.2628 | 0.6107 | 2.4611 | 0.7253 |
| Hampton City, Virginia | 1.3194 | 0.7762 | -0.1257 | 0.1085 | -0.6623 |
| Elizabeth City, New Jersey | 1.3561 | -0.7474 | -1.1451 | -0.3275 | 0.7665 |
| Oakland City, California | 1.3591 | -2.0655 | 1.1312 | -1.8368 | 1.2078 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Boston City, Massachusetts | 1.3600 | -0.2348 | -0.0250 | -0.5419 | 0.4964 |
| Hartford City, Connecticut | 1.3760 | -1.8646 | -0.8281 | 0.7004 | 1.7488 |
| San Jose City, California | 1.3969 | 0.7160 | -0.9197 | 0.0144 | 0.1138 |
| Vallejo City, California | 1.5728 | -0.5949 | 0.1416 | -1.2768 | 0.6073 |
| Colorado Springs City, Colorado | 1.6536 | 0.3239 | -0.6314 | -0.0810 | -0.3301 |
| Lafayette City, Louisiana | 1.7060 | 1.4887 | 0.0127 | 0.5899 | 0.2085 |
| Berkeley City, California | 1.7869 | -0.3082 | -1.1566 | -0.3508 | -0.2075 |
| Wilmington City, North Carolina | 2.0132 | -0.0952 | -1.3394 | 0.8978 | -0.8359 |
| Fairfield City, California | 2.0328 | -0.4731 | -0.6310 | -0.2602 | 0.3735 |
| Port Arthur City, Texas | 2.0465 | 1.0927 | -0.2104 | 1.5368 | -0.7221 |
| Paterson City, New Jersey | 2.1731 | 1.0710 | -0.5440 | -0.0551 | -0.3094 |
| Springfield City, Massachusetts | 2.2524 | -0.3165 | -0.7377 | 0.2602 | -0.1819 |
| Tulsa City, Oklahoma | 2.2541 | 0.7111 | -0.3869 | 0.0100 | 0.0686 |
| North Charleston City, South Carolina | 2.2749 | -1.0214 | 0.1396 | -0.2027 | -1.6888 |
| Syracuse City, New York | 2.2822 | 0.0878 | -0.8445 | 0.5068 | -0.8484 |
| Jersey City City, New Jersey | 2.5029 | 0.3228 | -0.5001 | 0.3229 | -0.0824 |
| Goldsboro City, North Carolina | 2.5831 | 0.4485 | 2.4456 | -3.1574 | -0.0420 |
| Buffalo City, New York | 2.6392 | -2.0241 | -0.5514 | 0.5385 | 0.0826 |
| Baton Rouge City, Louisiana | 2.9495 | -1.1803 | 1.3033 | 2.6089 | 2.2587 |
| Plainfield City, New Jersey | 3.1633 | -0.2704 | -0.5205 | -1.2576 | -0.1973 |
| Charleston City, South Carolina | 3.2346 | -0.5701 | -1.1586 | 0.2007 | 1.0335 |
| Flint City, Michigan | 3.5742 | -0.5849 | 0.7085 | -3.8278 | 1.7547 |
| Newark City, New Jersey | 3.5769 | -2.1558 | -1.0063 | -0.6674 | 0.3541 |

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Table A5 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Petersburg City, Virginia | 3.9873 | 0.1511 | 0.8720 | 2.8383 | -1.9181 |
| Atlantic City City, New Jersey | 4.8849 | -0.2415 | 0.7084 | -0.2818 | 2.3029 |
| Harrisburg City, Pennsylvania | 5.1147 | -1.7955 | 1.0518 | 2.2328 | -0.5892 |
| Trenton City, New Jersey | 5.9462 | -0.9199 | -1.8274 | -2.7299 | -1.9011 |
| Wilmington City, Delaware | 10.2614 | -1.2756 | -0.2979 | -1.3034 | 1.0038 |
| Chester City, Pennsylvania | 13.6608 | -5.9172 | 4.2054 | -0.8805 | -5.0951 |

### A4.9 City-Level Black Firearm Homicide Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Richmond City, Virginia | -14.9929 | -8.0611 | -1.1235 |
| Bridgeport City, Connecticut | -12.5890 | 0.5970 | -1.5481 |
| Fort Worth City, Texas | -10.6199 | 3.6784 | 2.6504 |
| Los Angeles City, California | -9.7517 | -2.7212 | 0.0979 |
| Amarillo City, Texas | -9.2231 | -0.0913 | 4.9078 |
| Dallas City, Texas | -8.8854 | 2.0641 | 1.5942 |
| Compton City, California | -8.0139 | -12.5568 | -4.9745 |
| New York City, New York | -7.9856 | 1.4899 | 0.2657 |
| Shreveport City, Louisiana | -7.9361 | -1.1537 | 1.9846 |
| Cleveland City, Ohio | -7.7303 | 7.0827 | 4.1770 |
| Waco City, Texas | -7.4225 | -1.2562 | 1.5271 |
| Atlanta City, Georgia | -7.4146 | -0.3221 | -2.8794 |
| Greenville City, South Carolina | -7.0803 | 4.5371 | -1.7237 |
| Portland City, Oregon | -6.3139 | -2.6281 | -2.0967 |
| Wichita Falls City, Texas | -6.0841 | 2.1965 | -2.3144 |
| **St. Louis City, Missouri** | -6.0820 | -0.6095 | 9.5316 |
| Charlotte City, North Carolina | -5.9753 | 0.1139 | 0.0485 |
| Tacoma City, Washington | -5.7132 | -1.7681 | -1.6322 |
| Phoenix City, Arizona | -5.6737 | -5.2845 | -2.9133 |
| Pasadena City, California | -5.6570 | 1.6911 | 4.9380 |
| Inglewood City, California | -5.5400 | -5.6095 | -1.1895 |
| San Antonio City, Texas | -5.4846 | 1.8216 | 4.2764 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Ontario City, California | -5.3932 | -2.9723 | 3.0880 |
| Albany City, Georgia | -5.3061 | 3.5935 | 0.5103 |
| North Little Rock City, Arkansas | -4.9390 | -6.9160 | -4.0256 |
| Gastonia City, North Carolina | -4.8445 | -0.2900 | -1.2933 |
| Detroit City, Michigan | -4.7324 | 1.9767 | -1.8515 |
| Spartanburg City, South Carolina | -4.6116 | -4.6328 | 0.1288 |
| Portsmouth City, Virginia | -4.4180 | 0.3687 | 1.1367 |
| Fontana City, California | -4.3385 | -0.0443 | 1.2056 |
| Winston-Salem City, North Carolina | -4.0199 | 0.4154 | -1.0015 |
| Lubbock City, Texas | -3.9645 | 6.9756 | 0.0554 |
| Lima City, Ohio | -3.9529 | -1.1230 | 4.0916 |
| Long Beach City, California | -3.8060 | -1.7306 | 0.5208 |
| Grand Prairie City, Texas | -3.5911 | -0.2129 | -1.1666 |
| High Point City, North Carolina | -3.4429 | 3.2059 | -1.1167 |
| Texas City City, Texas | -3.0128 | 0.3192 | -1.1305 |
| Corpus Christi City, Texas | -2.8476 | 10.3475 | 2.4889 |
| Grand Rapids City, Michigan | -2.7662 | 1.3804 | -1.9772 |
| Alexandria City, Louisiana | -2.4647 | 6.6900 | 4.5562 |
| Vicksburg City, Mississippi | -2.4218 | 3.7313 | -2.2501 |
| Columbus City, Ohio | -2.3839 | -0.3070 | 1.0478 |
| Little Rock City, Arkansas | -2.3768 | -2.4973 | 3.4493 |
| Irving City, Texas | -2.3425 | 6.1519 | -0.0780 |
| Columbia City, South Carolina | -2.1457 | 1.0230 | -1.8397 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Rochester City, New York | -2.0732 | -5.2927 | -1.2993 |
| Valdosta City, Georgia | -2.0166 | 4.3055 | 0.3361 |
| Las Vegas City, Nevada | -1.9380 | -4.0770 | 1.9452 |
| Jackson City, Mississippi | -1.8789 | -0.8738 | 0.4017 |
| Austin City, Texas | -1.8215 | 5.2554 | 0.1019 |
| Roanoke City, Virginia | -1.8119 | 1.7591 | -1.8873 |
| Tyler City, Texas | -1.7093 | 1.7466 | -0.1474 |
| Norfolk City, Virginia | -1.6969 | -2.7080 | 1.7947 |
| East Orange City, New Jersey | -1.6904 | 0.2107 | -4.5508 |
| Albuquerque City, New Mexico | -1.5770 | 3.1763 | -4.4024 |
| Philadelphia City, Pennsylvania | -1.4032 | -3.5983 | -1.7204 |
| Seattle City, Washington | -1.3266 | 1.5650 | 0.9079 |
| Durham City, North Carolina | -1.2019 | -0.7418 | -1.1196 |
| **Kansas City City, Missouri** | -1.1642 | -1.2430 | 0.0561 |
| Suffolk City, Virginia | -1.1010 | -0.1002 | -0.3002 |
| Denver City, Colorado | -1.0951 | 1.1558 | 0.2702 |
| Waterbury City, Connecticut | -0.9278 | 1.0615 | -0.4732 |
| Lansing City, Michigan | -0.8666 | 1.3586 | -1.1278 |
| Beaumont City, Texas | -0.8154 | 3.1253 | 0.6365 |
| Fayetteville City, North Carolina | -0.7487 | -1.1078 | -0.5059 |
| Toledo City, Ohio | -0.7033 | 3.2690 | 2.3590 |
| Garland City, Texas | -0.5767 | 2.3509 | -0.7210 |
| Hayward City, California | -0.5117 | -2.6367 | -2.6080 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Riverside City, California | -0.4654 | -3.3184 | -0.1267 |
| San Diego City, California | -0.4640 | -0.1428 | -1.2224 |
| San Bernardino City, California | -0.4447 | -11.1815 | 15.9019 |
| St. Paul City, Minnesota | -0.2709 | 1.0778 | -1.2192 |
| Killeen City, Texas | -0.1736 | 2.8534 | 1.0715 |
| Pomona City, California | -0.0348 | -8.4222 | -4.5198 |
| Greensboro City, North Carolina | 0.3260 | 0.0755 | -0.2261 |
| Sacramento City, California | 0.4784 | -0.1426 | 0.7859 |
| Arlington City, Texas | 0.5898 | 4.3594 | 1.2755 |
| Dayton City, Ohio | 0.6818 | 1.8649 | 5.0810 |
| Baltimore City, Maryland | 0.6881 | -3.4832 | -0.1369 |
| Providence City, Rhode Island | 0.7922 | -3.9923 | -9.1404 |
| Sumter City, South Carolina | 0.9784 | 1.5568 | -0.4222 |
| Meridian City, Mississippi | 0.9970 | 5.1915 | 1.2094 |
| Yonkers City, New York | 1.0318 | 0.0898 | -2.3871 |
| Asheville City, North Carolina | 1.0749 | 2.4266 | 1.7500 |
| Rocky Mount City, North Carolina | 1.0779 | 0.4022 | -1.1022 |
| Pittsburg City, California | 1.1948 | 0.5291 | -0.0883 |
| Pine Bluff City, Arkansas | 1.2438 | -0.5077 | -1.4958 |
| El Paso City, Texas | 1.3607 | 0.5809 | -0.5807 |
| Savannah City, Georgia | 1.4087 | 3.1749 | -0.5287 |
| Palmdale City, California | 1.4925 | -2.5771 | 0.3131 |
| Mount Vernon City, New York | 1.6073 | 2.4397 | -2.2490 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Carson City, California | 1.6810 | -0.6887 | -4.1270 |
| Richmond City, California | 1.9775 | -18.6027 | 3.5828 |
| Berkeley City, California | 2.1649 | -1.2449 | -5.0060 |
| Albany City, New York | 2.1835 | -0.3065 | -5.4742 |
| Plainfield City, New Jersey | 2.3839 | 1.7413 | 0.4961 |
| Port Arthur City, Texas | 2.3929 | 2.9049 | -0.2415 |
| Saginaw City, Michigan | 2.5010 | -2.0704 | 3.4449 |
| Lawton City, Oklahoma | 2.5577 | 4.2269 | -0.5638 |
| Gulfport City, Mississippi | 2.6166 | 1.4022 | -3.3911 |
| Oklahoma City City, Oklahoma | 2.6552 | 1.2127 | 0.1283 |
| Rialto City, California | 2.6658 | -3.8245 | -2.5161 |
| Lafayette City, Louisiana | 2.7895 | 4.7602 | 1.3259 |
| Aurora City, Colorado | 2.7969 | 2.9760 | -2.2346 |
| Paterson City, New Jersey | 2.8800 | 3.6169 | -0.0695 |
| Virginia Beach City, Virginia | 2.9133 | -0.5566 | -0.4134 |
| Longview City, Texas | 2.9274 | 2.0089 | 6.9996 |
| Boston City, Massachusetts | 2.9594 | -2.5725 | 0.0551 |
| San Jose City, California | 3.2522 | 2.7645 | -1.9986 |
| Mesquite City, Texas | 3.3723 | 4.1499 | -1.7059 |
| Newport News City, Virginia | 3.4282 | 1.5334 | -0.7929 |
| Fresno City, California | 3.5890 | -4.8799 | 1.9726 |
| Colorado Springs City, Colorado | 3.5909 | 0.6244 | -3.8627 |
| Danville City, Virginia | 3.5936 | 0.6401 | -0.7029 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Petersburg City, Virginia | 3.9477 | 1.7212 | 1.2226 |
| Tucson City, Arizona | 3.9492 | -1.5582 | -7.0196 |
| Flint City, Michigan | 4.0902 | 2.4045 | 1.3169 |
| Hampton City, Virginia | 4.0920 | 1.5770 | -0.0250 |
| Erie City, Pennsylvania | 4.1881 | 7.3026 | -0.3784 |
| Jersey City City, New Jersey | 4.8471 | 1.3690 | -0.0020 |
| Bakersfield City, California | 4.8840 | -9.7035 | 4.4924 |
| Baton Rouge City, Louisiana | 5.0435 | -0.7338 | 0.3663 |
| Stockton City, California | 5.0914 | 0.0792 | 0.7664 |
| Vallejo City, California | 5.1877 | 0.1797 | -1.1849 |
| Springfield City, Massachusetts | 5.3274 | -2.0922 | 1.0852 |
| Wilmington City, North Carolina | 5.5210 | 3.7202 | -0.3985 |
| Hartford City, Connecticut | 5.6447 | -2.4057 | -3.9720 |
| Charleston City, South Carolina | 5.6539 | 0.8011 | -1.5729 |
| Goldsboro City, North Carolina | 5.8777 | 3.0465 | 2.3369 |
| Elizabeth City, New Jersey | 6.0489 | -3.3994 | -2.3630 |
| North Charleston City, South Carolina | 6.4064 | 0.6465 | 0.4797 |
| Oakland City, California | 6.4699 | -2.7425 | 0.8333 |
| Buffalo City, New York | 6.9107 | -4.4322 | 0.9611 |
| Newark City, New Jersey | 7.0957 | -1.7947 | -0.2174 |
| Harrisburg City, Pennsylvania | 7.5735 | 0.7524 | 0.1025 |
| Syracuse City, New York | 8.0804 | 1.4962 | 0.5526 |
| Fairfield City, California | 8.2686 | 0.8451 | -0.1041 |

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Table A6 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Tulsa City, Oklahoma | 8.4618 | 0.7651 | 1.6776 |
| Trenton City, New Jersey | 10.8384 | 0.0329 | 0.3688 |
| Atlantic City City, New Jersey | 11.2853 | 2.9357 | -0.7683 |
| San Francisco City, California | 14.8322 | -12.4557 | 0.5468 |
| Wilmington City, Delaware | 15.8445 | 2.1542 | 0.3272 |
| Chester City, Pennsylvania | 16.4419 | 0.1948 | 7.6236 |

### A4.10 City-Level Black Non-Gun Homicide Factor Loadings

| City | Factor 1 |
|---|---|
| Pittsburg City, California | -14.5063 |
| Stockton City, California | -5.5358 |
| Wichita Falls City, Texas | -3.9149 |
| Amarillo City, Texas | -3.4451 |
| Lawton City, Oklahoma | -3.2328 |
| Yonkers City, New York | -2.5747 |
| Jersey City City, New Jersey | -2.5031 |
| Providence City, Rhode Island | -2.3060 |
| Irving City, Texas | -2.1559 |
| Las Vegas City, Nevada | -2.0161 |
| North Charleston City, South Carolina | -1.9973 |
| Corpus Christi City, Texas | -1.9337 |
| Killeen City, Texas | -1.8894 |
| Fontana City, California | -1.8667 |
| Lubbock City, Texas | -1.8525 |
| Lima City, Ohio | -1.8115 |
| Phoenix City, Arizona | -1.7013 |
| Meridian City, Mississippi | -1.6812 |
| Gulfport City, Mississippi | -1.6371 |
| Los Angeles City, California | -1.5238 |
| Aurora City, Colorado | -1.4663 |
| San Antonio City, Texas | -1.2464 |

*Continued on next page*

Table A7 – *Continued from previous page*

| City | Factor 1 |
|---|---|
| Garland City, Texas | -1.1798 |
| Austin City, Texas | -1.1314 |
| Grand Prairie City, Texas | -1.0831 |
| Lansing City, Michigan | -1.0147 |
| Paterson City, New Jersey | -0.9563 |
| Columbia City, South Carolina | -0.9526 |
| Toledo City, Ohio | -0.9490 |
| Inglewood City, California | -0.9170 |
| Tyler City, Texas | -0.8575 |
| Springfield City, Massachusetts | -0.8215 |
| St. Paul City, Minnesota | -0.7925 |
| Baton Rouge City, Louisiana | -0.7900 |
| Little Rock City, Arkansas | -0.7880 |
| Newport News City, Virginia | -0.7590 |
| Danville City, Virginia | -0.6965 |
| Vicksburg City, Mississippi | -0.6419 |
| Buffalo City, New York | -0.5953 |
| Detroit City, Michigan | -0.5642 |
| Portland City, Oregon | -0.5463 |
| Riverside City, California | -0.5409 |
| Spartanburg City, South Carolina | -0.4558 |
| Philadelphia City, Pennsylvania | -0.4464 |
| Beaumont City, Texas | -0.4281 |

*Continued on next page*

Table A7 – *Continued from previous page*

| City | Factor 1 |
|---|---|
| El Paso City, Texas | -0.3924 |
| New York City, New York | -0.3816 |
| Mount Vernon City, New York | -0.3753 |
| Wilmington City, North Carolina | -0.3733 |
| Colorado Springs City, Colorado | -0.3526 |
| Tucson City, Arizona | -0.3253 |
| Carson City, California | -0.2555 |
| Greenville City, South Carolina | -0.2437 |
| Richmond City, Virginia | -0.2079 |
| Savannah City, Georgia | -0.2026 |
| Texas City City, Texas | -0.1998 |
| Petersburg City, Virginia | -0.1819 |
| Port Arthur City, Texas | -0.0647 |
| Mesquite City, Texas | -0.0516 |
| Chester City, Pennsylvania | -0.0453 |
| Oakland City, California | -0.0452 |
| Harrisburg City, Pennsylvania | -0.0281 |
| Dallas City, Texas | -0.0080 |
| Grand Rapids City, Michigan | 0.0152 |
| Rochester City, New York | 0.0314 |
| Bakersfield City, California | 0.0442 |
| Hartford City, Connecticut | 0.0539 |
| East Orange City, New Jersey | 0.1317 |

*Continued on next page*

Table A7 – *Continued from previous page*

| City | Factor 1 |
|---|---|
| Suffolk City, Virginia | 0.1604 |
| Hampton City, Virginia | 0.1617 |
| Shreveport City, Louisiana | 0.1674 |
| Cleveland City, Ohio | 0.1830 |
| Boston City, Massachusetts | 0.1836 |
| Pasadena City, California | 0.2024 |
| Columbus City, Ohio | 0.2271 |
| Tulsa City, Oklahoma | 0.2340 |
| Fort Worth City, Texas | 0.2928 |
| Richmond City, California | 0.3394 |
| Rocky Mount City, North Carolina | 0.3543 |
| Vallejo City, California | 0.3653 |
| Durham City, North Carolina | 0.3666 |
| Denver City, Colorado | 0.3867 |
| Albany City, Georgia | 0.3981 |
| Sumter City, South Carolina | 0.4367 |
| Wilmington City, Delaware | 0.4543 |
| Tacoma City, Washington | 0.4795 |
| Greensboro City, North Carolina | 0.5197 |
| Baltimore City, Maryland | 0.5507 |
| San Francisco City, California | 0.5791 |
| Newark City, New Jersey | 0.5869 |
| Berkeley City, California | 0.5966 |

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Table A7 – *Continued from previous page*

| City | Factor 1 |
|---|---|
| **Kansas City City, Missouri** | 0.6069 |
| San Diego City, California | 0.6335 |
| Erie City, Pennsylvania | 0.6401 |
| Valdosta City, Georgia | 0.6963 |
| Asheville City, North Carolina | 0.7087 |
| Syracuse City, New York | 0.7133 |
| Pine Bluff City, Arkansas | 0.7558 |
| Virginia Beach City, Virginia | 0.7596 |
| Dayton City, Ohio | 0.8281 |
| Fairfield City, California | 0.8345 |
| Plainfield City, New Jersey | 0.8833 |
| Bridgeport City, Connecticut | 0.8847 |
| Long Beach City, California | 0.8994 |
| Charlotte City, North Carolina | 0.9023 |
| Jackson City, Mississippi | 0.9258 |
| Goldsboro City, North Carolina | 0.9266 |
| Albany City, New York | 0.9424 |
| Compton City, California | 0.9889 |
| Seattle City, Washington | 1.0026 |
| San Jose City, California | 1.0283 |
| High Point City, North Carolina | 1.0484 |
| Rialto City, California | 1.0560 |
| Pomona City, California | 1.0804 |

*Continued on next page*

Table A7 – *Continued from previous page*

| City | Factor 1 |
|---|---|
| Oklahoma City City, Oklahoma | 1.0861 |
| Sacramento City, California | 1.1014 |
| Arlington City, Texas | 1.2059 |
| Atlanta City, Georgia | 1.2311 |
| Winston-Salem City, North Carolina | 1.2325 |
| Waco City, Texas | 1.4787 |
| Saginaw City, Michigan | 1.4851 |
| Gastonia City, North Carolina | 1.4871 |
| Portsmouth City, Virginia | 1.5072 |
| Hayward City, California | 1.5436 |
| Alexandria City, Louisiana | 1.5536 |
| Trenton City, New Jersey | 1.5857 |
| **St. Louis City, Missouri** | 1.7625 |
| Flint City, Michigan | 1.8134 |
| Waterbury City, Connecticut | 1.8356 |
| Roanoke City, Virginia | 1.8721 |
| Norfolk City, Virginia | 1.8765 |
| Atlantic City City, New Jersey | 1.9569 |
| Longview City, Texas | 2.0144 |
| Charleston City, South Carolina | 2.0840 |
| Ontario City, California | 2.0893 |
| Fayetteville City, North Carolina | 2.1595 |
| San Bernardino City, California | 2.2998 |

*Continued on next page*

Table A7 – *Continued from previous page*

| City | Factor 1 |
| --- | --- |
| North Little Rock City, Arkansas | 2.3205 |
| Fresno City, California | 2.4922 |
| Palmdale City, California | 2.7179 |
| Lafayette City, Louisiana | 3.0314 |
| Albuquerque City, New Mexico | 3.3103 |
| Elizabeth City, New Jersey | 4.0577 |

## A4.11 City-Level Black Aggravated Assault Arrest Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Gastonia City, North Carolina | -906.6460 | 644.9869 | -381.0496 |
| Aurora City, Colorado | -622.3714 | -764.2190 | -290.6266 |
| Springfield City, Massachusetts | -515.8498 | -258.3309 | -83.5382 |
| Vallejo City, California | -341.0842 | 54.2504 | -98.5795 |
| Hayward City, California | -308.5035 | 205.6049 | 26.9615 |
| Atlanta City, Georgia | -295.7872 | -18.6936 | 60.4522 |
| Berkeley City, California | -291.6488 | -74.0007 | -83.9140 |
| Charlotte City, North Carolina | -278.2493 | 148.5076 | -68.3631 |
| Columbus City, Ohio | -272.9933 | 318.0000 | -11.9202 |
| Fontana City, California | -260.7061 | -37.4471 | -56.7970 |
| Pasadena City, California | -260.5449 | -88.5561 | -3.3939 |
| Pomona City, California | -260.4230 | -219.6271 | -44.5678 |
| Asheville City, North Carolina | -247.8203 | 435.4784 | -55.2929 |
| Chester City, Pennsylvania | -226.5131 | 98.5780 | 51.9620 |
| Ontario City, California | -219.9251 | -92.1052 | -155.5628 |
| San Francisco City, California | -211.4023 | 217.4344 | 130.0843 |
| Little Rock City, Arkansas | -191.1865 | 75.0767 | 13.6537 |
| St. Paul City, Minnesota | -168.9042 | -101.3204 | -66.6489 |
| Palmdale City, California | -168.6408 | -77.0802 | -13.4413 |
| Long Beach City, California | -163.4823 | 214.0575 | 8.8374 |
| Rialto City, California | -130.6927 | -47.7757 | 50.8723 |
| San Diego City, California | -130.0403 | 105.3073 | 13.9852 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Garland City, Texas | -120.0535 | -40.9073 | 3.4789 |
| Pittsburg City, California | -117.1654 | -173.2614 | -40.8991 |
| Tucson City, Arizona | -107.3507 | -146.9729 | 6.0327 |
| Grand Rapids City, Michigan | -98.2710 | 29.3416 | -63.3302 |
| Jersey City City, New Jersey | -97.7733 | 51.5542 | 21.8022 |
| Newport News City, Virginia | -97.0128 | -0.2617 | -56.8162 |
| Grand Prairie City, Texas | -92.8475 | -183.3286 | -0.3083 |
| Fresno City, California | -92.6375 | 123.2726 | 35.9856 |
| Boston City, Massachusetts | -89.1895 | 50.6149 | 13.1408 |
| Bakersfield City, California | -88.2879 | -113.8000 | 95.9241 |
| Baton Rouge City, Louisiana | -85.5344 | -254.8761 | -24.7803 |
| San Jose City, California | -84.0332 | 45.2062 | 26.2644 |
| Riverside City, California | -78.1675 | -29.0929 | -42.7172 |
| Atlantic City City, New Jersey | -77.6094 | -158.8527 | 109.3717 |
| Phoenix City, Arizona | -76.9889 | -206.0649 | -90.0732 |
| Los Angeles City, California | -74.0487 | -30.0059 | 5.8078 |
| Harrisburg City, Pennsylvania | -68.9322 | -117.1022 | 5.2110 |
| Goldsboro City, North Carolina | -64.4230 | -6.6157 | 28.7436 |
| Newark City, New Jersey | -58.1173 | -15.6265 | -34.6181 |
| Compton City, California | -57.9465 | -178.8756 | 30.9809 |
| Wilmington City, North Carolina | -55.6089 | 55.0351 | 77.6895 |
| Providence City, Rhode Island | -50.5210 | -210.7024 | 6.5262 |
| Winston-Salem City, North Carolina | -46.4513 | -40.9080 | 17.9659 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Albany City, New York | -45.9704 | 28.4198 | 79.3641 |
| Mesquite City, Texas | -45.8993 | -68.4352 | 68.9945 |
| Oakland City, California | -43.9227 | -166.5175 | -11.3512 |
| Lawton City, Oklahoma | -42.5390 | 39.5099 | 5.1431 |
| San Bernardino City, California | -42.0238 | 166.3587 | -67.5961 |
| Rocky Mount City, North Carolina | -40.0531 | -173.4805 | 147.6051 |
| Syracuse City, New York | -30.5510 | 195.7464 | 65.8878 |
| Norfolk City, Virginia | -29.4339 | 93.0719 | -75.3279 |
| Lansing City, Michigan | -27.5783 | 73.3913 | -55.7799 |
| El Paso City, Texas | -23.5561 | -7.5506 | 31.0484 |
| Petersburg City, Virginia | -23.5108 | -29.3790 | -36.5999 |
| Hartford City, Connecticut | -22.0656 | -57.9980 | 12.7100 |
| Dallas City, Texas | -22.0318 | -97.8038 | 0.9423 |
| Tulsa City, Oklahoma | -15.3237 | 4.8162 | 30.7205 |
| Wichita Falls City, Texas | -13.9153 | 89.8019 | 48.8334 |
| Spartanburg City, South Carolina | -10.2629 | 229.8130 | -5.6109 |
| Fort Worth City, Texas | -6.4399 | -66.8891 | -19.3819 |
| Irving City, Texas | -4.1080 | -48.0643 | 32.2487 |
| Sacramento City, California | 0.6552 | 14.4661 | 22.8100 |
| Portland City, Oregon | 1.9049 | -151.4291 | 55.7301 |
| Paterson City, New Jersey | 3.7429 | -65.1402 | 21.0889 |
| Tacoma City, Washington | 4.8670 | -32.0352 | -34.3028 |
| Greensboro City, North Carolina | 6.3255 | -45.9461 | 39.4403 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Virginia Beach City, Virginia | 7.9275 | -48.2633 | 31.7254 |
| Inglewood City, California | 11.9146 | -131.5214 | 55.5947 |
| Greenville City, South Carolina | 18.5865 | 139.1058 | 1.5340 |
| Amarillo City, Texas | 19.1511 | -25.8553 | 5.3816 |
| Longview City, Texas | 21.9738 | -13.3981 | 56.0209 |
| Waco City, Texas | 22.1904 | 67.8964 | 5.0085 |
| Corpus Christi City, Texas | 25.9208 | -27.1843 | -16.9601 |
| Tyler City, Texas | 29.0207 | -3.9137 | 20.1665 |
| Plainfield City, New Jersey | 31.1286 | -72.1904 | 60.7632 |
| Arlington City, Texas | 31.1819 | 12.4625 | 160.7149 |
| Richmond City, California | 32.3720 | -224.2858 | -26.0933 |
| Richmond City, Virginia | 38.1511 | -19.5516 | 9.5625 |
| Hampton City, Virginia | 43.1346 | 20.8415 | 26.9217 |
| Columbia City, South Carolina | 44.6779 | 56.7868 | 37.8115 |
| Colorado Springs City, Colorado | 44.9519 | -103.8781 | -8.7287 |
| Carson City, California | 47.0446 | -26.3252 | 28.1935 |
| Killeen City, Texas | 49.2977 | -29.8048 | 26.1339 |
| Erie City, Pennsylvania | 50.3677 | 19.5688 | 1.7035 |
| Port Arthur City, Texas | 51.2086 | -22.2218 | 20.3712 |
| Flint City, Michigan | 53.8194 | 7.9840 | -10.9526 |
| Stockton City, California | 56.3889 | 155.1904 | 59.8702 |
| Jackson City, Mississippi | 57.2920 | -105.6621 | 26.1200 |
| Fairfield City, California | 58.5026 | 110.0930 | -47.2141 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Albany City, Georgia | 59.2355 | 303.6044 | -218.1768 |
| Detroit City, Michigan | 61.0096 | 49.6640 | 20.3940 |
| East Orange City, New Jersey | 61.1843 | -50.7665 | 4.3225 |
| Waterbury City, Connecticut | 63.2641 | -61.9105 | 86.5763 |
| Gulfport City, Mississippi | 66.4334 | -34.2928 | 74.4743 |
| Durham City, North Carolina | 67.1295 | 112.1774 | 34.6632 |
| Sumter City, South Carolina | 73.1405 | 77.8379 | 47.3829 |
| Toledo City, Ohio | 75.0070 | 54.6256 | -41.9396 |
| Lafayette City, Louisiana | 77.0869 | 119.8998 | 127.9246 |
| Cleveland City, Ohio | 78.5858 | 29.3655 | 22.7813 |
| North Charleston City, South Carolina | 79.0581 | 96.3375 | 68.2904 |
| Bridgeport City, Connecticut | 82.0867 | 39.9228 | 72.9742 |
| Shreveport City, Louisiana | 82.8574 | -21.0922 | 64.5406 |
| Beaumont City, Texas | 90.9659 | -31.7616 | 7.6661 |
| Charleston City, South Carolina | 91.1747 | 101.5308 | 13.8046 |
| Yonkers City, New York | 91.3516 | -1.8697 | 67.6579 |
| High Point City, North Carolina | 92.8682 | 93.0735 | 146.9049 |
| Denver City, Colorado | 93.2917 | -41.3167 | -65.8106 |
| Fayetteville City, North Carolina | 96.1092 | -142.9153 | 54.5014 |
| Portsmouth City, Virginia | 104.6336 | 56.6824 | 7.2725 |
| Albuquerque City, New Mexico | 105.8561 | -32.7360 | -34.1055 |
| Austin City, Texas | 106.0151 | -69.8323 | -8.0640 |
| Pine Bluff City, Arkansas | 106.4356 | 133.6586 | -12.9200 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Elizabeth City, New Jersey | 108.7947 | -64.0727 | 35.7312 |
| Baltimore City, Maryland | 110.0987 | -35.2482 | 4.1100 |
| Dayton City, Ohio | 113.7261 | 8.5080 | 2.1543 |
| North Little Rock City, Arkansas | 113.7775 | 39.6791 | 52.1463 |
| Oklahoma City City, Oklahoma | 122.4085 | -114.6439 | 52.2870 |
| Suffolk City, Virginia | 122.4876 | 40.6719 | 12.1128 |
| Alexandria City, Louisiana | 122.5389 | 159.6537 | -38.1625 |
| Mount Vernon City, New York | 122.9457 | -53.9687 | 58.2813 |
| Trenton City, New Jersey | 123.9229 | 8.9086 | 6.1769 |
| San Antonio City, Texas | 127.9953 | -12.1364 | 29.5760 |
| Savannah City, Georgia | 132.9750 | -7.7534 | 15.5426 |
| Buffalo City, New York | 142.8453 | 49.8510 | 42.8027 |
| Meridian City, Mississippi | 143.6601 | -41.3814 | -21.2080 |
| Saginaw City, Michigan | 144.9010 | 121.4681 | 61.2577 |
| Lubbock City, Texas | 145.5767 | 29.0045 | 70.8194 |
| Philadelphia City, Pennsylvania | 150.6557 | 35.9214 | 71.1440 |
| Rochester City, New York | 154.1844 | -48.0757 | 32.9585 |
| Roanoke City, Virginia | 175.7624 | 39.7241 | 69.8662 |
| **Kansas City City, Missouri** | 185.7181 | -3.8404 | -228.0450 |
| Danville City, Virginia | 197.1199 | 5.0572 | 14.3857 |
| Valdosta City, Georgia | 248.2575 | 35.6648 | 260.0700 |
| Wilmington City, Delaware | 252.6734 | 56.2608 | 83.4818 |
| Seattle City, Washington | 289.5443 | -59.6231 | -15.4934 |

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Table A8 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Vicksburg City, Mississippi | 333.4619 | 132.6182 | 72.8626 |
| Texas City City, Texas | 362.7908 | 114.6844 | 153.9396 |
| Las Vegas City, Nevada | 456.3078 | -64.3209 | -12.2795 |
| Lima City, Ohio | 480.8338 | 25.9903 | -797.2372 |
| **St. Louis City, Missouri** | 887.1278 | -24.9838 | -585.1573 |

### A4.12 City-Level Black Weapons Arrest Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Denver City, Colorado | -236.83 | 59.03 | 4.75 | 36.51 | -19.37 |
| **Kansas City City, Missouri** | -169.52 | -44.48 | -176.14 | -26.90 | -23.32 |
| Colorado Springs City, Colorado | -165.33 | 29.42 | -20.78 | -48.34 | 45.83 |
| Portland City, Oregon | -164.27 | -27.68 | -2.86 | 36.34 | 24.62 |
| Texas City City, Texas | -154.72 | -5.12 | -19.49 | -56.57 | 53.48 |
| North Little Rock City, Arkansas | -143.22 | -149.64 | -47.22 | -87.60 | 2.66 |
| Norfolk City, Virginia | -117.14 | -1.76 | -4.59 | 28.39 | -0.83 |
| Fayetteville City, North Carolina | -111.70 | 40.84 | 8.42 | 10.26 | 21.78 |
| Waterbury City, Connecticut | -102.44 | -4.03 | -71.47 | 29.57 | -8.04 |
| Tacoma City, Washington | -101.61 | -78.68 | -47.08 | 7.37 | -8.66 |
| Toledo City, Ohio | -93.05 | 1.61 | 22.96 | 23.76 | -32.35 |
| Grand Prairie City, Texas | -90.38 | 31.19 | -18.84 | -15.99 | 3.75 |
| Amarillo City, Texas | -85.25 | -9.52 | 35.68 | 22.53 | 6.88 |
| Atlanta City, Georgia | -72.39 | -215.61 | 120.63 | -61.19 | 89.59 |
| Columbia City, South Carolina | -69.70 | -5.50 | 95.02 | 98.81 | -27.35 |
| Fort Worth City, Texas | -68.14 | 1.92 | -12.66 | -4.92 | 3.67 |
| Mesquite City, Texas | -63.36 | 58.21 | -3.95 | 8.85 | 6.87 |
| Richmond City, Virginia | -62.10 | 26.71 | -30.73 | 27.38 | -22.98 |
| Lubbock City, Texas | -59.81 | 1.74 | 7.02 | -20.10 | 20.48 |
| **St. Louis City, Missouri** | -59.59 | -18.84 | -67.28 | 26.97 | -39.54 |
| Flint City, Michigan | -56.18 | 39.84 | 62.55 | 31.44 | -8.08 |
| Aurora City, Colorado | -55.37 | -8.95 | -49.74 | -79.82 | 74.01 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Lansing City, Michigan | -55.36 | -18.75 | -3.50 | 5.61 | -33.04 |
| Winston-Salem City, North Carolina | -55.02 | -52.99 | 10.11 | 20.72 | -38.73 |
| Spartanburg City, South Carolina | -54.13 | 3.42 | 36.34 | 56.17 | 1.36 |
| Phoenix City, Arizona | -53.27 | -61.05 | -1.97 | 4.50 | 8.51 |
| Oakland City, California | -51.70 | 40.30 | -33.77 | -2.48 | 29.30 |
| Petersburg City, Virginia | -51.04 | 7.79 | -19.20 | 2.35 | 2.56 |
| Albuquerque City, New Mexico | -50.19 | 12.58 | 15.58 | 16.44 | -0.03 |
| Meridian City, Mississippi | -49.52 | 138.79 | 14.33 | 35.61 | 9.28 |
| Riverside City, California | -48.13 | -17.64 | -10.34 | -17.48 | 22.75 |
| Rochester City, New York | -48.02 | -41.57 | 21.41 | 1.18 | -12.52 |
| Waco City, Texas | -47.80 | -18.34 | -8.55 | -13.26 | 2.85 |
| Dallas City, Texas | -46.81 | 25.12 | -3.94 | -23.40 | 19.80 |
| Port Arthur City, Texas | -46.21 | 25.91 | -24.68 | -11.67 | 14.01 |
| Roanoke City, Virginia | -45.91 | 4.80 | 10.09 | 73.40 | 6.78 |
| Bridgeport City, Connecticut | -44.24 | 63.00 | 20.85 | 10.10 | 7.48 |
| Detroit City, Michigan | -43.30 | 22.84 | 35.61 | 20.97 | 4.34 |
| Austin City, Texas | -38.44 | 63.36 | -14.41 | -17.39 | 35.50 |
| Corpus Christi City, Texas | -36.79 | 66.91 | 3.38 | 7.66 | 13.63 |
| Greensboro City, North Carolina | -34.74 | -122.61 | 4.82 | -12.62 | -27.39 |
| El Paso City, Texas | -32.52 | 20.66 | -5.29 | -20.06 | -2.52 |
| Las Vegas City, Nevada | -30.55 | 27.88 | -21.82 | 45.11 | 5.50 |
| Jackson City, Mississippi | -29.17 | 72.31 | -15.41 | 3.63 | -5.35 |
| Wichita Falls City, Texas | -28.51 | -27.65 | 8.94 | 9.89 | -15.52 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Jersey City City, New Jersey | -25.07 | -23.40 | 71.69 | -10.66 | -21.53 |
| Springfield City, Massachusetts | -24.92 | -16.66 | -17.89 | -17.57 | -28.62 |
| Suffolk City, Virginia | -22.83 | -22.31 | 2.27 | -10.88 | -19.81 |
| Portsmouth City, Virginia | -20.94 | 24.67 | 11.17 | 9.98 | -12.61 |
| Ontario City, California | -20.84 | -3.11 | -3.86 | -13.35 | 10.07 |
| Oklahoma City City, Oklahoma | -18.90 | 26.57 | 28.24 | -17.81 | 34.90 |
| Pomona City, California | -17.99 | 27.05 | 19.35 | 2.13 | 9.98 |
| Carson City, California | -17.15 | 46.23 | 15.23 | 10.11 | -4.64 |
| Tyler City, Texas | -15.66 | 2.50 | 28.63 | 16.74 | -13.16 |
| Danville City, Virginia | -14.27 | 4.15 | -27.03 | 5.13 | -20.72 |
| Longview City, Texas | -11.34 | -14.64 | 7.23 | -11.49 | 12.85 |
| Tucson City, Arizona | -11.15 | -54.95 | 20.46 | -1.57 | -3.58 |
| Columbus City, Ohio | -11.09 | -11.56 | -21.43 | -8.56 | -37.80 |
| San Antonio City, Texas | -10.65 | 14.91 | -13.12 | -11.62 | 11.03 |
| Cleveland City, Ohio | -9.37 | 12.23 | -5.88 | 8.03 | 18.70 |
| Rialto City, California | -7.61 | 13.95 | -18.37 | -7.72 | -0.15 |
| Grand Rapids City, Michigan | -7.59 | -28.77 | -5.78 | 35.61 | -16.04 |
| Little Rock City, Arkansas | -7.17 | -69.45 | 13.98 | -26.55 | 7.63 |
| Vallejo City, California | -6.90 | -18.68 | -56.73 | 4.00 | -13.88 |
| San Diego City, California | -6.78 | 41.37 | 9.03 | 2.34 | 6.89 |
| Beaumont City, Texas | -5.67 | 22.65 | -21.62 | 2.38 | -26.01 |
| Garland City, Texas | -5.32 | -62.89 | -6.41 | 39.24 | -24.34 |
| Pasadena City, California | -3.81 | -5.23 | 11.03 | 4.78 | 6.48 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Charlotte City, North Carolina | -3.74 | -4.08 | 0.57 | -6.92 | 0.80 |
| Newport News City, Virginia | -2.09 | -25.21 | 25.27 | -9.12 | 17.64 |
| East Orange City, New Jersey | -1.46 | 50.51 | 38.67 | -3.14 | 11.08 |
| Fontana City, California | -0.01 | 18.76 | 33.60 | 21.13 | -16.08 |
| Richmond City, California | 0.85 | 16.21 | -90.11 | -40.02 | 1.78 |
| High Point City, North Carolina | 1.16 | -72.87 | 9.25 | -13.75 | -18.16 |
| Killeen City, Texas | 3.48 | 35.78 | -14.97 | -12.67 | 15.89 |
| San Jose City, California | 5.30 | 29.07 | 9.11 | -3.73 | 6.53 |
| Albany City, Georgia | 5.59 | 20.92 | -0.24 | -11.76 | -1.50 |
| Baltimore City, Maryland | 6.83 | 22.35 | 25.59 | 12.86 | -3.22 |
| Shreveport City, Louisiana | 7.87 | 24.43 | -15.93 | -2.98 | -11.63 |
| Sumter City, South Carolina | 8.28 | 17.67 | 38.44 | 20.14 | -22.38 |
| Los Angeles City, California | 10.45 | 30.06 | 0.66 | 3.93 | 6.66 |
| Virginia Beach City, Virginia | 10.64 | -43.87 | 22.86 | 18.12 | -15.77 |
| Inglewood City, California | 10.97 | 21.29 | 16.86 | -3.72 | -0.22 |
| Irving City, Texas | 11.89 | -34.14 | -6.72 | -13.62 | -22.66 |
| Providence City, Rhode Island | 13.00 | 63.49 | 11.59 | 9.42 | -19.95 |
| Arlington City, Texas | 14.17 | -8.37 | -3.48 | -13.73 | -0.22 |
| Hampton City, Virginia | 15.81 | -30.88 | 6.23 | 13.02 | -18.43 |
| Hayward City, California | 17.49 | -12.17 | 4.28 | -1.16 | -11.15 |
| Pine Bluff City, Arkansas | 19.64 | 8.47 | 16.13 | 18.21 | -9.17 |
| San Francisco City, California | 20.04 | 12.49 | 14.02 | -5.39 | 18.76 |
| Savannah City, Georgia | 21.86 | 14.38 | 5.32 | -18.51 | 12.63 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Berkeley City, California | 24.15 | 27.68 | -43.81 | 11.58 | -6.43 |
| Greenville City, South Carolina | 24.26 | -22.65 | -4.03 | 15.24 | -32.99 |
| Philadelphia City, Pennsylvania | 28.49 | 6.63 | 30.13 | -3.83 | 0.72 |
| Gastonia City, North Carolina | 29.54 | -77.15 | 55.79 | 14.40 | -27.49 |
| Pittsburg City, California | 29.99 | 37.30 | -15.10 | -3.51 | 20.17 |
| Newark City, New Jersey | 30.45 | 21.50 | 85.01 | -10.39 | 9.49 |
| Albany City, New York | 30.65 | -31.11 | 80.85 | -36.68 | 23.91 |
| Dayton City, Ohio | 30.79 | 18.30 | 21.15 | -19.26 | -0.06 |
| Atlantic City City, New Jersey | 31.08 | 24.00 | 22.84 | -10.94 | 51.54 |
| Long Beach City, California | 32.93 | -21.14 | 18.62 | -28.32 | 14.26 |
| Elizabeth City, New Jersey | 33.59 | 31.27 | 38.28 | -10.35 | 23.13 |
| Plainfield City, New Jersey | 34.52 | 58.07 | 71.22 | -14.04 | 15.16 |
| Saginaw City, Michigan | 34.57 | 46.03 | 23.50 | 18.59 | 24.68 |
| Mount Vernon City, New York | 36.04 | 29.50 | 19.62 | -8.46 | -9.55 |
| Boston City, Massachusetts | 36.18 | -4.32 | -16.91 | -8.06 | -14.85 |
| Paterson City, New Jersey | 37.49 | 29.68 | 6.17 | -13.04 | -12.36 |
| Charleston City, South Carolina | 38.30 | 49.91 | 8.29 | 43.74 | -15.80 |
| Buffalo City, New York | 41.78 | -13.69 | -2.71 | 5.66 | -11.46 |
| Durham City, North Carolina | 41.97 | -10.27 | 43.85 | -30.26 | 4.93 |
| Wilmington City, Delaware | 42.71 | 70.38 | 38.73 | -12.32 | -28.12 |
| Tulsa City, Oklahoma | 44.95 | 6.57 | -25.63 | -14.10 | 11.23 |
| Syracuse City, New York | 46.32 | -106.10 | 29.82 | 30.30 | -42.75 |
| San Bernardino City, California | 47.89 | -23.52 | -19.39 | 2.05 | -6.87 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Stockton City, California | 52.23 | 35.67 | -75.08 | -3.09 | 8.49 |
| Palmdale City, California | 58.52 | -0.77 | -13.87 | -14.77 | 20.79 |
| Hartford City, Connecticut | 58.84 | -5.82 | 30.46 | -7.25 | -10.61 |
| Wilmington City, North Carolina | 59.03 | -6.87 | 47.25 | -14.72 | -21.48 |
| Gulfport City, Mississippi | 61.99 | 3.49 | -20.67 | 25.46 | -24.86 |
| Trenton City, New Jersey | 62.35 | -2.67 | 76.82 | 3.56 | -24.63 |
| Fairfield City, California | 65.10 | 4.61 | -24.86 | -11.44 | -15.89 |
| Vicksburg City, Mississippi | 66.96 | -4.11 | -5.60 | 17.47 | -3.66 |
| Baton Rouge City, Louisiana | 67.30 | 14.47 | -22.52 | 7.50 | 0.45 |
| Asheville City, North Carolina | 67.49 | -38.37 | 27.54 | 1.01 | -30.75 |
| Erie City, Pennsylvania | 69.53 | 45.34 | -4.28 | -6.12 | -32.80 |
| Lima City, Ohio | 70.61 | -10.55 | -99.82 | -22.04 | -74.75 |
| Valdosta City, Georgia | 72.21 | 5.81 | 5.37 | -16.51 | 67.12 |
| Goldsboro City, North Carolina | 74.76 | -59.73 | 56.17 | -26.38 | -24.68 |
| Sacramento City, California | 77.20 | 16.23 | -76.64 | -16.31 | -11.69 |
| North Charleston City, South Carolina | 95.16 | -12.31 | 16.80 | 14.32 | -13.24 |
| Fresno City, California | 99.33 | 13.17 | -82.89 | -29.60 | 0.11 |
| Lafayette City, Louisiana | 101.90 | -16.27 | -41.59 | -15.99 | -27.68 |
| Chester City, Pennsylvania | 103.76 | -5.38 | -25.02 | -26.15 | -21.35 |
| Alexandria City, Louisiana | 107.89 | 0.49 | 35.56 | -11.90 | -18.11 |
| Harrisburg City, Pennsylvania | 117.84 | -8.26 | 8.30 | -2.64 | -15.94 |
| Lawton City, Oklahoma | 119.76 | -0.20 | -40.15 | -26.70 | 20.66 |
| Yonkers City, New York | 140.64 | -0.45 | 2.86 | -45.52 | 28.27 |

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Table A9 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Bakersfield City, California | 144.93 | 9.03 | -23.32 | -8.79 | 50.71 |
| Compton City, California | 145.03 | 12.16 | -33.61 | -51.67 | 30.47 |
| Rocky Mount City, North Carolina | 146.68 | -59.25 | -63.94 | -32.87 | 11.60 |
| Seattle City, Washington | 154.48 | 25.63 | -10.01 | -29.51 | 17.72 |
| St. Paul City, Minnesota | 158.27 | -116.70 | -99.51 | 291.58 | 116.66 |

### A4.13 City-Level Officer Gun Assault Factor Loadings

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Inglewood City, California | -2.5770 | -2.2281 | -0.0669 | -0.7158 | -0.4761 |
| **St. Louis City, Missouri** | -1.8419 | 1.2419 | 0.6761 | -0.7857 | 0.2442 |
| Richmond City, California | -1.5077 | 1.0146 | -1.1826 | -0.1199 | 0.3134 |
| Pasadena City, California | -1.4728 | 0.3724 | -0.3633 | 1.9743 | -0.6921 |
| Little Rock City, Arkansas | -1.3719 | 0.4702 | -0.2164 | -0.4067 | 0.1027 |
| Riverside City, California | -1.2787 | 0.0460 | -0.2078 | 0.5857 | 0.2869 |
| Ontario City, California | -0.7119 | 0.0973 | 0.0836 | 0.3393 | 0.0885 |
| Long Beach City, California | -0.7023 | -0.3249 | 0.3933 | 0.5251 | 0.2471 |
| New York City, New York | -0.6755 | -0.1284 | -0.0152 | 0.0204 | 0.1567 |
| Fontana City, California | -0.6525 | 0.5461 | -0.7623 | -0.0043 | -0.3726 |
| Baltimore City, Maryland | -0.5327 | -0.1831 | 0.1049 | 0.1103 | 0.1712 |
| Cleveland City, Ohio | -0.4570 | -0.0060 | 0.2260 | 0.1393 | 0.3048 |
| **Kansas City City, Missouri** | -0.4496 | 0.1446 | 0.0311 | -0.1887 | -0.0294 |
| Grand Prairie City, Texas | -0.4128 | -0.1880 | -0.2973 | -0.0672 | 0.2978 |
| Seattle City, Washington | -0.3971 | -0.2626 | 0.0233 | -0.0644 | 0.2081 |
| Los Angeles City, California | -0.3756 | 0.1234 | -0.2825 | 0.1684 | 0.0852 |
| East Orange City, New Jersey | -0.3652 | 0.1433 | -0.1264 | -0.2541 | -0.0273 |
| Meridian City, Mississippi | -0.3413 | 0.1456 | 0.0195 | 0.1777 | -0.0796 |
| Fresno City, California | -0.3225 | 0.8234 | -0.8910 | -0.4739 | 0.6097 |
| Charlotte City, North Carolina | -0.3077 | -0.2451 | -0.0323 | 0.0860 | 0.0532 |
| Dayton City, Ohio | -0.2939 | -0.0521 | 0.0770 | 0.1334 | 0.0062 |
| Dallas City, Texas | -0.2853 | -0.0992 | 0.2509 | 0.1044 | 0.2304 |

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Table A10 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Sumter City, South Carolina | -0.2741 | -0.4126 | 0.4131 | -0.7653 | -0.0263 |
| Atlanta City, Georgia | -0.2385 | -0.0210 | -0.0241 | -0.0546 | 0.1489 |
| Richmond City, Virginia | -0.2297 | -0.0996 | 0.1281 | -0.0196 | -0.0004 |
| Wilmington City, North Carolina | -0.2147 | -0.1842 | 0.2250 | 0.0163 | -0.1767 |
| Tucson City, Arizona | -0.2047 | 0.2296 | 0.1913 | 0.0551 | -0.1089 |
| Greensboro City, North Carolina | -0.1880 | -0.2401 | 0.0601 | -0.2446 | -0.1070 |
| Mesquite City, Texas | -0.1677 | 0.0415 | 0.1752 | 0.0124 | 0.0963 |
| Aurora City, Colorado | -0.1466 | -0.0795 | 0.0448 | 0.1365 | -0.1944 |
| Fort Worth City, Texas | -0.1343 | 0.0159 | 0.1440 | 0.2292 | 0.1066 |
| Columbus City, Ohio | -0.1086 | 0.0677 | 0.0915 | -0.0898 | 0.1116 |
| High Point City, North Carolina | -0.1040 | 0.2490 | 0.0063 | 0.2411 | -0.0611 |
| Lubbock City, Texas | -0.0955 | -0.1483 | 0.1480 | 0.2920 | -0.1026 |
| Lafayette City, Louisiana | -0.0800 | 0.1850 | 1.0121 | 1.1464 | 0.1646 |
| Hayward City, California | -0.0794 | -0.2586 | 0.4394 | 0.2972 | 0.1391 |
| Winston-Salem City, North Carolina | -0.0720 | -0.0734 | -0.1513 | 0.0136 | -0.0042 |
| Albany City, New York | -0.0711 | -0.1202 | -0.0658 | -0.0831 | -0.1130 |
| Savannah City, Georgia | -0.0604 | -0.1713 | 0.1604 | 0.1948 | 0.1642 |
| North Little Rock City, Arkansas | -0.0567 | -0.2145 | 0.2083 | -0.1800 | 0.1443 |
| Arlington City, Texas | -0.0506 | -0.1139 | 0.1518 | -0.0833 | 0.0434 |
| El Paso City, Texas | -0.0428 | -0.2249 | -0.0233 | -0.1804 | 0.1097 |
| Longview City, Texas | -0.0315 | 0.1209 | -0.0675 | -0.2016 | 0.2722 |
| St. Paul City, Minnesota | -0.0305 | -0.0981 | -0.0854 | 0.0441 | -0.1070 |
| San Antonio City, Texas | -0.0294 | -0.1206 | 0.0163 | 0.0073 | 0.0757 |

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Table A10 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Mount Vernon City, New York | -0.0247 | -0.0549 | -0.0670 | -0.1301 | 0.1182 |
| Providence City, Rhode Island | -0.0240 | -0.0893 | 0.1645 | -0.0494 | 0.0285 |
| Newark City, New Jersey | -0.0170 | -0.1483 | -0.0770 | -0.4089 | -0.0362 |
| Goldsboro City, North Carolina | -0.0123 | 0.0379 | -0.3163 | 0.1638 | -1.3995 |
| Asheville City, North Carolina | -0.0087 | -0.2383 | 0.3780 | -0.2826 | -0.0112 |
| Pine Bluff City, Arkansas | -0.0083 | -0.0483 | 0.3657 | -0.1013 | 0.2580 |
| Fairfield City, California | -0.0026 | -0.1186 | -0.1042 | -0.2878 | -0.0900 |
| Oakland City, California | 0.0121 | 0.1034 | -0.0986 | 0.0245 | -0.0594 |
| Yonkers City, New York | 0.0185 | 0.0007 | -0.0221 | -0.1205 | -0.0616 |
| Irving City, Texas | 0.0257 | -0.0746 | 0.1851 | 0.0352 | -0.0711 |
| Valdosta City, Georgia | 0.0312 | 0.1871 | -0.1172 | 0.0894 | -0.3394 |
| Rochester City, New York | 0.0396 | -0.1019 | 0.2473 | 0.0334 | 0.0384 |
| Columbia City, South Carolina | 0.0426 | -0.4433 | 0.3095 | -0.2677 | 0.1255 |
| Buffalo City, New York | 0.0458 | -0.1310 | 0.0690 | 0.0053 | -0.0286 |
| Hartford City, Connecticut | 0.0491 | 0.0403 | -0.0322 | -0.1136 | 0.0296 |
| Portsmouth City, Virginia | 0.0520 | 0.1056 | -0.1601 | -0.0432 | -0.1066 |
| Elizabeth City, New Jersey | 0.0625 | 0.1875 | -0.0222 | -0.1062 | -0.1385 |
| Gastonia City, North Carolina | 0.0672 | -0.1507 | 0.1678 | -0.1539 | 0.1427 |
| Garland City, Texas | 0.0703 | 0.0853 | -0.0209 | -0.1897 | -0.1219 |
| Syracuse City, New York | 0.0716 | 0.0497 | -0.0349 | 0.0131 | -0.0887 |
| Atlantic City City, New Jersey | 0.0717 | 0.1119 | -0.1097 | -0.1312 | 0.0955 |
| Vicksburg City, Mississippi | 0.0723 | 0.1346 | 0.3727 | 0.1904 | -0.0551 |
| Albany City, Georgia | 0.0866 | 0.0120 | 0.0225 | -0.0813 | 0.0188 |

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Table A10 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Tacoma City, Washington | 0.0871 | 0.1638 | 0.0961 | -0.0983 | 0.2146 |
| Sacramento City, California | 0.0903 | 0.0017 | 0.1468 | 0.0271 | 0.0678 |
| Erie City, Pennsylvania | 0.1136 | 0.0585 | -0.2161 | 0.0432 | -0.0286 |
| San Francisco City, California | 0.1207 | -0.0284 | 0.0652 | 0.0443 | 0.0082 |
| Fayetteville City, North Carolina | 0.1221 | 0.1249 | -0.4933 | -0.2328 | 0.0046 |
| Lawton City, Oklahoma | 0.1286 | -0.1325 | 0.1224 | 0.0841 | -0.0550 |
| Durham City, North Carolina | 0.1297 | 0.3274 | -0.0191 | -0.0113 | -0.0775 |
| Portland City, Oregon | 0.1336 | 0.0847 | -0.0086 | -0.1460 | 0.0720 |
| Austin City, Texas | 0.1384 | -0.0314 | 0.0217 | -0.0636 | -0.0583 |
| Wilmington City, Delaware | 0.1408 | 0.0271 | -0.1298 | 0.0266 | -0.0026 |
| Waco City, Texas | 0.1416 | 0.0828 | 0.0515 | 0.0326 | 0.1275 |
| Detroit City, Michigan | 0.1469 | -0.0370 | 0.0422 | 0.0595 | -0.0076 |
| Shreveport City, Louisiana | 0.1523 | -0.1203 | 0.2135 | 0.1174 | 0.1848 |
| Norfolk City, Virginia | 0.1540 | 0.0003 | -0.0113 | -0.1008 | 0.0347 |
| Texas City City, Texas | 0.1607 | 0.2137 | 0.1043 | -0.0756 | -0.0599 |
| Waterbury City, Connecticut | 0.1639 | 0.0471 | 0.0177 | -0.0271 | -0.0148 |
| San Diego City, California | 0.1740 | 0.2335 | -0.1138 | -0.0578 | 0.0116 |
| Corpus Christi City, Texas | 0.1803 | -0.1579 | 0.0810 | 0.1552 | 0.1185 |
| Lansing City, Michigan | 0.1821 | -0.0111 | 0.1342 | -0.1653 | -0.0269 |
| Greenville City, South Carolina | 0.1875 | -0.2898 | 0.3067 | -0.0551 | -0.5026 |
| Trenton City, New Jersey | 0.1921 | -0.1139 | 0.1187 | -0.0594 | -0.0806 |
| Killeen City, Texas | 0.1988 | 0.0178 | -0.0052 | 0.1474 | -0.0292 |
| Petersburg City, Virginia | 0.2056 | -0.2336 | -0.0752 | 0.0354 | -0.1823 |

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Table A10 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Flint City, Michigan | 0.2101 | 0.1871 | 0.0259 | -0.1247 | 0.1456 |
| Alexandria City, Louisiana | 0.2126 | 0.0698 | 0.0911 | -0.0190 | -0.0300 |
| Berkeley City, California | 0.2191 | -0.0549 | 0.2665 | 0.1173 | 0.0757 |
| Denver City, Colorado | 0.2220 | 0.0056 | 0.1075 | 0.0525 | -0.0692 |
| Wichita Falls City, Texas | 0.2271 | 0.1206 | 0.0637 | -0.0591 | -0.1744 |
| Jersey City City, New Jersey | 0.2352 | 0.0337 | -0.0877 | -0.1493 | -0.0185 |
| Bridgeport City, Connecticut | 0.2355 | 0.1380 | -0.0606 | -0.1053 | -0.0321 |
| Tulsa City, Oklahoma | 0.2383 | 0.0899 | -0.0495 | -0.1144 | -0.3396 |
| Saginaw City, Michigan | 0.2441 | 0.2746 | -0.3540 | 0.0579 | 0.1750 |
| Paterson City, New Jersey | 0.2453 | 0.0344 | -0.0336 | -0.0881 | -0.0263 |
| Suffolk City, Virginia | 0.2467 | 0.2548 | 0.2287 | 0.4048 | -0.0706 |
| Grand Rapids City, Michigan | 0.2517 | 0.0845 | 0.0543 | -0.0588 | -0.0718 |
| Danville City, Virginia | 0.2551 | 0.1382 | 0.0328 | -0.1348 | -0.0208 |
| Boston City, Massachusetts | 0.2660 | 0.0280 | -0.0023 | -0.0672 | -0.0451 |
| Virginia Beach City, Virginia | 0.2736 | -0.0438 | 0.0609 | 0.0085 | 0.0747 |
| Phoenix City, Arizona | 0.2775 | 0.1320 | -0.1981 | -0.2003 | -0.2055 |
| Port Arthur City, Texas | 0.2883 | -0.0839 | -0.0796 | 0.0831 | 0.0992 |
| Rocky Mount City, North Carolina | 0.2911 | 0.1652 | -0.2990 | 0.3552 | -0.4545 |
| Springfield City, Massachusetts | 0.2975 | 0.0369 | -0.0081 | -0.0877 | 0.0859 |
| Hampton City, Virginia | 0.2998 | -0.1393 | -0.1025 | -0.0448 | 0.0065 |
| Harrisburg City, Pennsylvania | 0.3018 | -0.0111 | -0.0355 | -0.0180 | -0.0360 |
| Plainfield City, New Jersey | 0.3157 | 0.1177 | 0.1337 | -0.1804 | 0.2881 |
| Toledo City, Ohio | 0.3200 | 0.0314 | -0.1979 | -0.0150 | 0.0092 |

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Table A10 – *Continued from previous page*

| City | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Stockton City, California | 0.3218 | 0.1101 | -0.2655 | -0.0841 | -0.1832 |
| Roanoke City, Virginia | 0.3329 | 0.0748 | -0.0168 | -0.1190 | -0.0510 |
| Charleston City, South Carolina | 0.3485 | 0.0218 | 0.2785 | 0.2418 | -0.0079 |
| San Jose City, California | 0.3658 | -0.0291 | 0.0535 | 0.0147 | -0.0033 |
| Colorado Springs City, Colorado | 0.3682 | -0.2620 | 0.1931 | -0.0446 | 0.3620 |
| Baton Rouge City, Louisiana | 0.3836 | 0.0794 | 0.0483 | -0.0178 | -0.1568 |
| Las Vegas City, Nevada | 0.3842 | -0.0068 | -0.0033 | 0.1229 | -0.1441 |
| Bakersfield City, California | 0.3961 | 0.0799 | 0.0978 | 0.2677 | 0.1715 |
| Gulfport City, Mississippi | 0.4263 | 0.4360 | 0.5057 | -0.4942 | -0.5405 |
| Newport News City, Virginia | 0.4307 | 0.0242 | 0.1163 | -0.0934 | -0.1162 |
| North Charleston City, South Carolina | 0.4702 | -0.1509 | 0.0131 | -0.1528 | -0.0588 |
| Chester City, Pennsylvania | 0.5220 | -0.0589 | -0.3735 | 0.5264 | 0.1187 |
| Pomona City, California | 0.5307 | 0.1524 | 0.0545 | -0.1453 | -0.1556 |
| Oklahoma City City, Oklahoma | 0.5346 | -0.0368 | 0.2670 | 0.1083 | 0.1545 |
| San Bernardino City, California | 0.5529 | -0.5601 | 0.3232 | 0.6602 | 0.8645 |
| Pittsburg City, California | 0.6084 | 0.1601 | -0.0816 | -0.0301 | -0.0499 |
| Philadelphia City, Pennsylvania | 0.6157 | 0.3558 | -0.1540 | -0.1839 | -0.4079 |
| Rialto City, California | 0.6274 | -0.4217 | -1.1894 | 0.2355 | 1.0359 |
| Spartanburg City, South Carolina | 0.7537 | 0.3607 | -0.0532 | -0.4850 | -0.3218 |
| Vallejo City, California | 0.9295 | -1.4026 | -1.5606 | 0.2256 | -0.1459 |

## A4.14 County-Level FSS Implied Weights

| County | Jackson County | City of St. Louis |
|---|---|---|
| Jefferson County, AL | 1.1819 | 0.2641 |
| Mobile County, AL | 0.6439 | 0.1439 |
| Montgomery County, AL | 0.8036 | 0.1796 |
| Maricopa County, AZ | 0.5423 | 0.1212 |
| Pima County, AZ | -0.0546 | -0.0122 |
| Pulaski County, AR | -0.6257 | -0.1398 |
| Alameda County, CA | 0.8193 | 0.1831 |
| Contra Costa County, CA | 0.6553 | 0.1465 |
| Fresno County, CA | 0.9430 | 0.2108 |
| Kern County, CA | 0.4292 | 0.0959 |
| Los Angeles County, CA | 0.5682 | 0.1270 |
| Monterey County, CA | -0.0646 | -0.0144 |
| Orange County, CA | 0.5037 | 0.1126 |
| Riverside County, CA | 0.7175 | 0.1604 |
| Sacramento County, CA | -1.2985 | -0.2902 |
| San Bernardino County, CA | 0.6604 | 0.1476 |
| San Diego County, CA | 0.6412 | 0.1433 |
| San Francisco County, CA | 0.0641 | 0.0143 |
| San Joaquin County, CA | 0.7223 | 0.1614 |
| San Mateo County, CA | 1.0844 | 0.2424 |
| Santa Clara County, CA | 0.4519 | 0.1010 |
| Solano County, CA | 0.5597 | 0.1251 |

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Table A11 – *Continued from previous page*

| County | Jackson County | City of St. Louis |
|---|---|---|
| Stanislaus County, CA | 0.8514 | 0.1903 |
| Ventura County, CA | -0.3570 | -0.0798 |
| Adams County, CO | -0.6116 | -0.1367 |
| Denver County, CO | -0.3672 | -0.0821 |
| El Paso County, CO | -0.2611 | -0.0584 |
| Fairfield County, CT | -0.7605 | -0.1700 |
| Hartford County, CT | 0.0385 | 0.0086 |
| New Haven County, CT | -0.5000 | -0.1117 |
| New Castle County, DE | 0.1215 | 0.0272 |
| District of Columbia, DC | 0.6393 | 0.1429 |
| Brevard County, FL | -1.1377 | -0.2543 |
| Broward County, FL | 0.4802 | 0.1073 |
| Duval County, FL | -0.7809 | -0.1745 |
| Escambia County, FL | -1.9307 | -0.4315 |
| Hillsborough County, FL | -0.9787 | -0.2187 |
| Lee County, FL | -0.1273 | -0.0284 |
| Miami-Dade County, FL | 0.2772 | 0.0620 |
| Orange County, FL | -0.6258 | -0.1398 |
| Palm Beach County, FL | 0.2611 | 0.0583 |
| Pinellas County, FL | 0.2705 | 0.0605 |
| Polk County, FL | -1.6377 | -0.3660 |
| Volusia County, FL | -0.3211 | -0.0718 |
| Bibb County, GA | 0.7512 | 0.1679 |

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Table A11 – *Continued from previous page*

| County | Jackson County | City of St. Louis |
|---|---|---|
| Chatham County, GA | 0.1209 | 0.0270 |
| Cobb County, GA | -0.1098 | -0.0245 |
| DeKalb County, GA | 0.0091 | 0.0020 |
| Fulton County, GA | 0.9304 | 0.2079 |
| Richmond County, GA | -1.7885 | -0.3997 |
| Honolulu County, HI | -0.9482 | -0.2119 |
| Cook County, IL | 0.9616 | 0.2149 |
| St. Clair County, IL | -2.9653 | -0.6627 |
| Winnebago County, IL | 0.3547 | 0.0793 |
| Sedgwick County, KS | 0.4975 | 0.1112 |
| Wyandotte County, KS | -1.2769 | -0.2854 |
| Jefferson County, KY | -0.3805 | -0.0850 |
| Caddo Parish, LA | -0.1346 | -0.0301 |
| East Baton Rouge Parish, LA | 1.0572 | 0.2363 |
| Jefferson Parish, LA | 0.5942 | 0.1328 |
| Orleans Parish, LA | -0.3702 | -0.0827 |
| Anne Arundel County, MD | 0.1758 | 0.0393 |
| Baltimore County, MD | 0.3380 | 0.0755 |
| Montgomery County, MD | 0.0662 | 0.0148 |
| Prince George's County, MD | 0.4579 | 0.1023 |
| Baltimore city, MD | 0.5905 | 0.1320 |
| Hampden County, MA | 0.8512 | 0.1902 |
| Suffolk County, MA | -0.5927 | -0.1325 |

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Table A11 – *Continued from previous page*

| County | Jackson County | City of St. Louis |
|---|---|---|
| Genesee County, MI | 1.0480 | 0.2342 |
| Kent County, MI | 0.9503 | 0.2124 |
| Macomb County, MI | -0.5222 | -0.1167 |
| Oakland County, MI | -0.0679 | -0.0152 |
| Wayne County, MI | 0.7215 | 0.1613 |
| Hennepin County, MN | 1.3785 | 0.3081 |
| Ramsey County, MN | -0.8007 | -0.1789 |
| Hinds County, MS | 0.4685 | 0.1047 |
| Douglas County, NE | -0.9827 | -0.2196 |
| Clark County, NV | -0.2365 | -0.0529 |
| Washoe County, NV | 1.0009 | 0.2237 |
| Camden County, NJ | -0.0699 | -0.0156 |
| Essex County, NJ | 1.2864 | 0.2875 |
| Hudson County, NJ | -0.4480 | -0.1001 |
| Passaic County, NJ | 0.5333 | 0.1192 |
| Union County, NJ | -2.1159 | -0.4729 |
| Bernalillo County, NM | -0.2548 | -0.0569 |
| New York, NY | 0.2541 | 0.0568 |
| Erie County, NY | 0.6831 | 0.1527 |
| Monroe County, NY | 0.5677 | 0.1269 |
| Nassau County, NY | 0.9478 | 0.2118 |
| Suffolk County, NY | 1.1887 | 0.2657 |
| Westchester County, NY | 1.0429 | 0.2331 |

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Table A11 – *Continued from previous page*

| County | Jackson County | City of St. Louis |
|---|---|---|
| Cumberland County, NC | 0.7524 | 0.1682 |
| Durham County, NC | -4.5571 | -1.0185 |
| Forsyth County, NC | -1.3205 | -0.2951 |
| Guilford County, NC | 0.7785 | 0.1740 |
| Mecklenburg County, NC | 0.2739 | 0.0612 |
| Wake County, NC | 0.8957 | 0.2002 |
| Cuyahoga County, OH | 0.8525 | 0.1905 |
| Franklin County, OH | -0.3663 | -0.0819 |
| Hamilton County, OH | 0.0202 | 0.0045 |
| Lucas County, OH | 0.9218 | 0.2060 |
| Mahoning County, OH | -0.8011 | -0.1790 |
| Montgomery County, OH | 0.2088 | 0.0467 |
| Oklahoma County, OK | -0.3455 | -0.0772 |
| Tulsa County, OK | -1.3151 | -0.2939 |
| Multnomah County, OR | 0.9048 | 0.2022 |
| Allegheny County, PA | 1.1175 | 0.2498 |
| Delaware County, PA | 1.2245 | 0.2737 |
| Montgomery County, PA | 0.5524 | 0.1235 |
| Philadelphia County, PA | 1.4496 | 0.3240 |
| Providence County, RI | 0.1484 | 0.0332 |
| Charleston County, SC | -0.4619 | -0.1032 |
| Greenville County, SC | -0.7508 | -0.1678 |
| Richland County, SC | 0.6812 | 0.1522 |

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Table A11 – *Continued from previous page*

| County | Jackson County | City of St. Louis |
|---|---|---|
| Bexar County, TX | 0.0785 | 0.0175 |
| Dallas County, TX | 0.1463 | 0.0327 |
| El Paso County, TX | -0.4300 | -0.0961 |
| Harris County, TX | -0.3540 | -0.0791 |
| Jefferson County, TX | -0.6786 | -0.1517 |
| Nueces County, TX | -1.5882 | -0.3549 |
| Tarrant County, TX | -0.3298 | -0.0737 |
| Travis County, TX | -0.3173 | -0.0709 |
| Salt Lake County, UT | 0.2711 | 0.0606 |
| Fairfax County, VA | 0.2603 | 0.0582 |
| Newport News city, VA | -10.4275 | -2.3304 |
| Norfolk city, VA | -0.4504 | -0.1007 |
| Richmond city, VA | 0.3006 | 0.0672 |
| King County, WA | 0.8784 | 0.1963 |
| Pierce County, WA | 1.3060 | 0.2919 |
| Milwaukee County, WI | 1.0512 | 0.2349 |

## A4.15 State-Level NICS Handgun Check Implied Weights

| State | Weight | State | Weight | State | Weight |
|---|---|---|---|---|---|
| Alabama | -1.6925 | Louisiana | -1.4877 | Oklahoma | -2.0680 |
| Alaska | -0.9554 | Maine | -2.2178 | Oregon | -1.4294 |
| Arizona | 0.3752 | Maryland | 2.1263 | Pennsylvania | 0.9469 |
| Arkansas | -2.9050 | Massachusetts | 3.0363 | Rhode Island | 2.4723 |
| California | -0.1375 | Michigan | 3.0717 | South Carolina | -1.5805 |
| Colorado | -6.2474 | Minnesota | 1.7575 | South Dakota | -0.5938 |
| Connecticut | 4.8996 | Mississippi | -5.7723 | Texas | -0.3810 |
| Delaware | 0.1988 | Montana | -3.1863 | Utah | 4.3019 |
| District of Columbia | 2.6101 | Nebraska | 2.9604 | Vermont | -1.9537 |
| Florida | 4.7900 | Nevada | 3.1538 | Virginia | 0.0081 |
| Georgia | 2.2456 | New Hampshire | -3.0751 | Washington | 3.2682 |
| Hawaii | 4.1480 | New Jersey | 2.7740 | West Virginia | -6.3306 |
| Idaho | 0.0076 | New Mexico | -3.4068 | Wisconsin | -2.4163 |
| Illinois | 0.2442 | New York | 3.3388 | Wyoming | -5.2867 |
| Iowa | 2.3122 | North Carolina | 2.8808 | | |
| Kansas | -0.0416 | North Dakota | -0.8049 | | |
| Kentucky | -4.2790 | Ohio | -0.6795 | | |

### A4.16 City-Level Homicide Implied Weights

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Pine Bluff City, Arkansas | 0.3883 | 0.2350 | -0.3803 | -0.0458 |
| Little Rock City, Arkansas | 0.2034 | 0.2649 | 0.5805 | 0.2356 |
| North Little Rock City, Arkansas | 1.3667 | -0.0204 | 2.3995 | -0.3423 |
| Phoenix City, Arizona | 0.2634 | -0.2038 | 1.4279 | -0.0488 |
| Tucson City, Arizona | -0.7536 | -0.2357 | -0.2409 | -0.5839 |
| Berkeley City, California | -0.7282 | -0.1316 | 0.8817 | -0.4263 |
| Hayward City, California | -0.7168 | -0.0735 | -0.0742 | -0.1127 |
| Oakland City, California | -0.2796 | 0.0835 | 0.4877 | -0.2046 |
| Pittsburg City, California | -0.5491 | -0.1110 | -1.6427 | 0.0934 |
| Richmond City, California | 1.1947 | 0.2234 | 2.6066 | -0.2615 |
| Fresno City, California | 0.4213 | 0.0660 | 1.4993 | -0.2875 |
| Bakersfield City, California | -0.3507 | -0.1027 | 0.4502 | -0.2660 |
| Compton City, California | 7.9693 | -0.2360 | 3.3913 | -0.7300 |
| Inglewood City, California | 2.3911 | -0.0492 | 1.3388 | -0.3048 |
| Long Beach City, California | 1.0387 | 0.0662 | 0.6249 | 0.1696 |
| Los Angeles City, California | 1.6611 | 0.0192 | 1.7632 | 0.1434 |
| Palmdale City, California | -0.2418 | -0.0800 | 0.5347 | -0.1879 |
| Pasadena City, California | -0.2603 | 0.0420 | -0.2042 | 0.3904 |
| Pomona City, California | 0.4536 | -0.0212 | 2.0339 | -0.0721 |
| Carson City, California | -0.4806 | -0.0887 | -0.4686 | -0.2356 |
| Riverside City, California | -0.0352 | -0.0464 | 1.0818 | -0.0214 |

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Table A12 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Sacramento City, California | 0.2487 | -0.0764 | 0.0564 | 0.0330 |
| Fontana City, California | 0.3063 | 0.0132 | 0.2661 | 0.3559 |
| Ontario City, California | 0.2295 | 0.0375 | 1.4972 | 0.4089 |
| Rialto City, California | -1.0203 | -0.0728 | 0.0721 | -0.2788 |
| San Bernardino City, California | 1.2024 | 0.3943 | 0.2667 | 1.0726 |
| San Diego City, California | -0.1170 | -0.0595 | 0.4764 | -0.1534 |
| San Francisco City, California | -0.5739 | -0.0498 | 0.3991 | -0.5015 |
| Stockton City, California | -0.2926 | 0.0159 | -1.6735 | 0.4130 |
| San Jose City, California | -1.0135 | -0.1124 | -1.1888 | -0.0680 |
| Fairfield City, California | -1.3602 | -0.0508 | -0.7737 | -0.0580 |
| Vallejo City, California | -1.0430 | 0.0315 | -0.3894 | -0.1424 |
| Aurora City, Colorado | -0.5844 | -0.1585 | -0.6672 | -0.1045 |
| Colorado Springs City, Colorado | -1.2380 | -0.0730 | -0.2601 | -0.3157 |
| Denver City, Colorado | 0.1276 | -0.0343 | -0.0758 | 0.0493 |
| Bridgeport City, Connecticut | 3.2034 | 0.2458 | 1.9173 | 0.1300 |
| Hartford City, Connecticut | -0.4988 | -0.1416 | -0.5534 | -0.3348 |
| Waterbury City, Connecticut | -0.1165 | 0.0017 | 0.5333 | 0.2051 |
| Wilmington City, Delaware | -5.1885 | -0.0104 | -2.5571 | -0.0825 |
| Savannah City, Georgia | -0.9889 | -0.0060 | -1.2571 | 0.0178 |
| Albany City, Georgia | 1.9106 | 0.2062 | 0.4934 | 0.0124 |
| Valdosta City, Georgia | 1.8970 | -0.0380 | 0.9317 | -0.1757 |
| Atlanta City, Georgia | 3.2173 | -0.0042 | 1.3525 | -0.1265 |

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Table A12 – *Continued from previous page*

| City | Overall | | Black | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Shreveport City, Louisiana | 1.4921 | 0.2681 | 0.1531 | 0.3428 |
| Baton Rouge City, Louisiana | -1.2683 | 0.1306 | -0.9099 | 0.0485 |
| Lafayette City, Louisiana | -0.9559 | 0.0830 | -0.7227 | 0.2467 |
| Alexandria City, Louisiana | 0.1245 | 0.3052 | -1.1111 | 0.5287 |
| Springfield City, Massachusetts | -1.3931 | -0.0905 | -0.4006 | -0.1547 |
| Boston City, Massachusetts | -0.5440 | -0.0070 | -0.0165 | -0.0390 |
| Baltimore City, Maryland | -0.2551 | 0.1205 | 0.2191 | -0.0649 |
| Flint City, Michigan | -0.3859 | -0.1376 | 0.1564 | -0.1292 |
| Lansing City, Michigan | -0.3440 | -0.0695 | -0.3914 | -0.1080 |
| Grand Rapids City, Michigan | 0.2497 | -0.0591 | -0.3288 | 0.3332 |
| Saginaw City, Michigan | 0.8468 | -0.2712 | 0.3955 | 0.1091 |
| Detroit City, Michigan | 2.5123 | -0.0791 | 0.8506 | -0.0910 |
| St. Paul City, Minnesota | -0.0614 | -0.0963 | 0.3164 | -0.0887 |
| Gulfport City, Mississippi | 0.0237 | -0.1954 | -0.1309 | -0.3442 |
| Jackson City, Mississippi | 0.9307 | 0.3875 | 0.1777 | 0.2067 |
| Meridian City, Mississippi | 0.0352 | 0.0086 | -1.6917 | 0.3485 |
| Vicksburg City, Mississippi | 0.7490 | 0.1522 | 0.2716 | -0.1220 |
| Asheville City, North Carolina | -0.3882 | 0.1106 | -1.1088 | 0.0619 |
| Fayetteville City, North Carolina | 0.5902 | 0.0840 | 0.4473 | -0.1768 |
| Durham City, North Carolina | -0.2143 | -0.0875 | 0.2731 | -0.1077 |
| Rocky Mount City, North Carolina | 0.8292 | 0.2256 | 0.1412 | 0.0221 |
| Winston-Salem City, North Carolina | 0.6396 | 0.0839 | 0.7438 | 0.0309 |

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Table A12 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Gastonia City, North Carolina | 1.5094 | 0.0815 | 1.2859 | -0.1178 |
| Greensboro City, North Carolina | 0.0491 | -0.0085 | 0.2386 | -0.1163 |
| High Point City, North Carolina | 0.5355 | 0.1014 | 0.6223 | -0.0270 |
| Charlotte City, North Carolina | 1.2142 | 0.1013 | 0.9989 | 0.1967 |
| Wilmington City, North Carolina | -1.7329 | -0.0623 | -1.8434 | 0.0544 |
| Goldsboro City, North Carolina | -0.0838 | 0.1078 | -0.9153 | 0.1191 |
| Atlantic City City, New Jersey | -0.7652 | 0.0875 | -1.7595 | 0.0686 |
| East Orange City, New Jersey | 0.9348 | -0.4249 | 0.1022 | -0.3266 |
| Jersey City City, New Jersey | -1.3559 | -0.1034 | -1.3259 | -0.0637 |
| Trenton City, New Jersey | -2.1131 | -0.2811 | -0.6400 | -0.4418 |
| Paterson City, New Jersey | -1.6802 | -0.0503 | -1.4576 | 0.0721 |
| Elizabeth City, New Jersey | -0.8281 | -0.1204 | 0.5779 | -0.3076 |
| Plainfield City, New Jersey | -1.8992 | -0.1724 | -0.4709 | -0.2523 |
| Newark City, New Jersey | -0.8265 | -0.0871 | -0.4321 | -0.1635 |
| Albuquerque City, New Mexico | -0.4469 | -0.1816 | 1.0291 | -0.1897 |
| Las Vegas City, Nevada | 0.4949 | 0.0716 | -0.5114 | 0.1902 |
| Albany City, New York | 0.1557 | -0.1681 | 0.0868 | -0.3278 |
| Buffalo City, New York | -1.1254 | 0.0438 | -0.1672 | -0.0512 |
| Rochester City, New York | 0.6321 | -0.0312 | 1.1743 | 0.0224 |
| New York City, New York | 1.4365 | 0.0883 | 0.9849 | 0.0956 |
| Syracuse City, New York | -1.1236 | -0.1013 | -1.2825 | -0.1639 |
| Mount Vernon City, New York | 0.0988 | -0.1824 | -0.5034 | -0.2830 |

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Table A12 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Yonkers City, New York | -0.4600 | -0.1536 | -0.5344 | -0.1073 |
| Lima City, Ohio | 0.3846 | -0.1568 | -0.4779 | 0.2534 |
| Toledo City, Ohio | -0.0079 | -0.0076 | -0.6078 | 0.2920 |
| Dayton City, Ohio | 0.2254 | 0.0836 | -0.4232 | 0.1561 |
| Cleveland City, Ohio | 1.0970 | 0.2385 | -0.5733 | 0.4990 |
| Columbus City, Ohio | 0.0900 | -0.0306 | 0.1813 | 0.1176 |
| Lawton City, Oklahoma | -1.1325 | -0.0065 | -1.4568 | 0.0266 |
| Oklahoma City City, Oklahoma | -0.7309 | -0.0670 | -0.7050 | 0.0387 |
| Tulsa City, Oklahoma | -1.4941 | -0.0763 | -1.4983 | -0.0654 |
| Portland City, Oregon | 0.2535 | -0.0598 | 1.2851 | 0.1647 |
| Harrisburg City, Pennsylvania | -2.5701 | 0.2728 | -1.4556 | -0.0186 |
| Chester City, Pennsylvania | -6.1916 | 1.0946 | -2.6400 | 0.5863 |
| Erie City, Pennsylvania | -1.2321 | -0.0552 | -2.1841 | 0.0562 |
| Philadelphia City, Pennsylvania | 0.5711 | -0.0154 | 0.3448 | -0.0710 |
| Providence City, Rhode Island | -0.2333 | -0.2196 | 0.2881 | -0.7392 |
| Charleston City, South Carolina | -1.7987 | -0.0939 | -0.6318 | -0.1043 |
| North Charleston City, South Carolina | -0.8317 | 0.1484 | -1.2597 | 0.0243 |
| Greenville City, South Carolina | 0.7560 | -0.0942 | 0.5600 | -0.0780 |
| Columbia City, South Carolina | 0.3850 | -0.0153 | -0.3025 | 0.0763 |
| Spartanburg City, South Carolina | 1.1909 | -0.0836 | 1.2432 | -0.2182 |
| Sumter City, South Carolina | 0.1146 | -0.1508 | -0.3785 | -0.2747 |
| Killeen City, Texas | -0.2076 | 0.1193 | -0.8763 | 0.1955 |

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Table A12 – *Continued from previous page*

| City | Overall | | Black | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Garland City, Texas | -0.3706 | -0.0637 | 0.0055 | 0.1054 |
| Grand Prairie City, Texas | 0.3891 | -0.1202 | 1.3494 | -0.2418 |
| Irving City, Texas | -0.2798 | -0.0844 | -0.8890 | 0.1159 |
| Mesquite City, Texas | 0.1628 | -0.1345 | -0.7891 | -0.2839 |
| El Paso City, Texas | -0.8629 | -0.0737 | -0.2798 | -0.0788 |
| Texas City City, Texas | -0.3258 | -0.1521 | -0.1320 | -0.1011 |
| Longview City, Texas | -0.8145 | -0.0617 | -0.7660 | 0.1831 |
| Beaumont City, Texas | -0.0554 | 0.1462 | -0.7346 | 0.1987 |
| Port Arthur City, Texas | -0.9428 | -0.0450 | -0.8049 | 0.0069 |
| Lubbock City, Texas | -0.4409 | -0.1411 | -0.7736 | 0.4503 |
| Waco City, Texas | 0.8285 | -0.0076 | 1.2876 | 0.0837 |
| Corpus Christi City, Texas | -0.9715 | -0.0239 | -2.0609 | 0.4388 |
| Amarillo City, Texas | -0.2893 | -0.1111 | -0.1140 | 0.8010 |
| Tyler City, Texas | 0.1755 | -0.1283 | -0.7755 | 0.2604 |
| Arlington City, Texas | 0.0147 | -0.1787 | -1.1716 | 0.1811 |
| Fort Worth City, Texas | 1.9569 | 0.1417 | 1.8424 | 0.3202 |
| Austin City, Texas | -0.5628 | -0.1695 | -0.6345 | 0.0497 |
| Wichita Falls City, Texas | 0.6854 | -0.2090 | 0.8037 | -0.4899 |
| Dallas City, Texas | 2.4225 | 0.0039 | 1.1928 | 0.1252 |
| San Antonio City, Texas | 0.5941 | 0.0471 | 0.3187 | 0.4225 |
| Danville City, Virginia | -1.0099 | 0.0923 | -0.8097 | -0.0586 |
| Hampton City, Virginia | -0.6592 | -0.0260 | -0.7541 | -0.1021 |

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Table A12 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Newport News City, Virginia | -0.6439 | -0.0148 | -0.8489 | -0.0040 |
| Norfolk City, Virginia | 0.5984 | 0.0929 | 1.0316 | -0.0861 |
| Petersburg City, Virginia | -2.7409 | 0.4198 | -1.1434 | 0.1437 |
| Portsmouth City, Virginia | 0.6970 | 0.2061 | 0.8400 | 0.0628 |
| Richmond City, Virginia | 5.2001 | 0.1203 | 2.9289 | -0.0329 |
| Roanoke City, Virginia | 0.1510 | -0.1953 | 0.2954 | -0.3587 |
| Suffolk City, Virginia | 0.8340 | -0.0794 | 0.8030 | -0.0168 |
| Virginia Beach City, Virginia | -0.6101 | -0.0863 | -0.2801 | -0.1164 |
| Tacoma City, Washington | 0.4263 | -0.0114 | 1.6988 | 0.0392 |
| Seattle City, Washington | -0.2891 | -0.0568 | 0.3842 | 0.0752 |

## A4.17 City-Level Firearm Homicide Implied Weights

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Pine Bluff City, Arkansas | 1.2267 | 0.1924 | 0.2138 | -0.1818 |
| Little Rock City, Arkansas | 1.4255 | 0.3688 | 1.2196 | 0.3014 |
| North Little Rock City, Arkansas | 0.6040 | 0.1243 | 6.1058 | -0.4309 |
| Phoenix City, Arizona | 0.4810 | -0.1529 | 5.2446 | -0.2648 |
| Tucson City, Arizona | -1.0162 | -0.2493 | 1.1972 | -0.7800 |
| Berkeley City, California | -1.0450 | -0.2206 | 1.1340 | -0.5430 |
| Hayward City, California | -0.5912 | -0.2313 | 2.1394 | -0.2968 |
| Oakland City, California | -0.9428 | 0.1964 | -0.9057 | -0.1728 |
| Pittsburg City, California | -0.1336 | -0.0459 | -0.6378 | -0.0241 |
| Richmond City, California | 1.5738 | 0.8235 | 7.9931 | -0.2610 |
| Fresno City, California | 0.7007 | 0.1230 | 0.8493 | -0.0559 |
| Bakersfield City, California | -0.1214 | -0.0863 | 2.2850 | -0.0008 |
| Compton City, California | 11.4806 | 0.5836 | 10.2144 | -0.5970 |
| Inglewood City, California | 3.9137 | 0.4662 | 4.9528 | -0.1224 |
| Long Beach City, California | 1.1596 | 0.2065 | 1.9971 | 0.0971 |
| Los Angeles City, California | 1.7685 | 0.1377 | 4.5395 | 0.1863 |
| Palmdale City, California | -0.5232 | -0.0798 | 0.7548 | -0.0846 |
| Pasadena City, California | 0.4601 | 0.1149 | -0.2090 | 0.6411 |
| Pomona City, California | 1.2540 | 0.0759 | 5.3975 | -0.6468 |
| Carson City, California | 0.0120 | -0.0905 | 0.7963 | -0.4353 |
| Riverside City, California | -0.4231 | -0.1201 | 1.8762 | -0.0941 |

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Table A13 – *Continued from previous page*

| City | Overall | | Black | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Sacramento City, California | -0.1419 | -0.0782 | -0.2717 | 0.0542 |
| Fontana City, California | 0.0436 | -0.0069 | 1.1448 | 0.2209 |
| Ontario City, California | 0.4260 | -0.0239 | 2.5306 | 0.3343 |
| Rialto City, California | -0.3907 | -0.0300 | 1.6897 | -0.4057 |
| San Bernardino City, California | 3.3824 | 0.6167 | 2.0320 | 1.1237 |
| San Diego City, California | -0.2627 | -0.0876 | 0.5177 | -0.1020 |
| San Francisco City, California | -0.6577 | -0.0598 | 1.4008 | -0.6952 |
| Stockton City, California | 0.0733 | 0.0703 | -1.8816 | -0.0620 |
| San Jose City, California | -1.3319 | -0.2421 | -1.9895 | -0.1861 |
| Fairfield City, California | -1.4087 | -0.1443 | -3.0974 | -0.2017 |
| Vallejo City, California | -1.2940 | -0.0412 | -1.4953 | -0.2374 |
| Aurora City, Colorado | -1.1283 | -0.2604 | -1.8926 | -0.1893 |
| Colorado Springs City, Colorado | -0.9433 | -0.1714 | -0.5592 | -0.4240 |
| Denver City, Colorado | -0.1339 | -0.1146 | -0.2987 | 0.0860 |
| Bridgeport City, Connecticut | 2.8831 | 0.4947 | 4.1643 | 0.2073 |
| Hartford City, Connecticut | -1.4185 | -0.0433 | 0.3457 | -0.5742 |
| Waterbury City, Connecticut | 0.3224 | -0.0375 | -0.1263 | 0.0120 |
| Wilmington City, Delaware | -6.1865 | -0.3518 | -6.3350 | -0.3238 |
| Savannah City, Georgia | -0.4260 | -0.1370 | -1.9524 | 0.0063 |
| Albany City, Georgia | 2.8403 | 0.3427 | -0.2305 | 0.2876 |
| Valdosta City, Georgia | 0.6126 | -0.0268 | -1.6226 | 0.2062 |
| Atlanta City, Georgia | 2.7245 | 0.1513 | 3.2695 | -0.0743 |

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Table A13 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Shreveport City, Louisiana | 3.3280 | 0.4790 | 2.6949 | 0.3535 |
| Baton Rouge City, Louisiana | -2.0515 | 0.2351 | -1.3548 | -0.1200 |
| Lafayette City, Louisiana | -1.5326 | -0.1496 | -3.6568 | 0.1824 |
| Alexandria City, Louisiana | 1.2916 | 0.1491 | -3.7084 | 0.6660 |
| Springfield City, Massachusetts | -1.1011 | -0.1507 | -0.9264 | -0.1016 |
| Boston City, Massachusetts | -1.1320 | -0.0593 | 0.3370 | -0.1461 |
| Baltimore City, Maryland | 1.6912 | 0.3946 | 1.5873 | -0.1299 |
| Flint City, Michigan | -3.5905 | -0.1309 | -2.8752 | 0.0802 |
| Lansing City, Michigan | -0.3058 | -0.1376 | -0.1406 | -0.0400 |
| Grand Rapids City, Michigan | -0.7063 | -0.1648 | 0.6706 | -0.0661 |
| Saginaw City, Michigan | 0.2039 | -0.3375 | -0.5848 | 0.1855 |
| Detroit City, Michigan | 0.7155 | 0.0446 | 0.9759 | 0.0137 |
| St. Paul City, Minnesota | -0.5378 | -0.1400 | -0.1691 | -0.0719 |
| Gulfport City, Mississippi | -1.3016 | -0.3084 | -0.7526 | -0.3337 |
| Jackson City, Mississippi | 3.0007 | 0.5317 | 0.9611 | 0.0604 |
| Meridian City, Mississippi | 0.0122 | -0.1860 | -3.2656 | 0.2312 |
| Vicksburg City, Mississippi | 0.0630 | 0.2426 | -0.5761 | -0.0325 |
| Asheville City, North Carolina | 0.1937 | -0.0071 | -2.0093 | 0.1988 |
| Fayetteville City, North Carolina | 0.0147 | 0.1032 | 0.9308 | -0.0576 |
| Durham City, North Carolina | 0.1415 | -0.1060 | 1.0389 | -0.0905 |
| Rocky Mount City, North Carolina | -0.0048 | 0.2535 | -0.2913 | -0.1160 |
| Winston-Salem City, North Carolina | 0.5727 | 0.0426 | 1.3368 | 0.0270 |

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Table A13 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Gastonia City, North Carolina | 1.2294 | 0.0773 | 2.0355 | 0.0021 |
| Greensboro City, North Carolina | 0.6581 | 0.1039 | -0.0903 | -0.0267 |
| High Point City, North Carolina | 0.8596 | 0.0604 | -0.2479 | 0.0813 |
| Charlotte City, North Carolina | 0.7864 | 0.1161 | 1.8748 | 0.1641 |
| Wilmington City, North Carolina | -0.5891 | -0.2168 | -3.6004 | -0.0741 |
| Goldsboro City, North Carolina | -1.5612 | 0.1489 | -4.0298 | 0.1436 |
| Atlantic City City, New Jersey | -4.1779 | -0.0895 | -4.9870 | -0.2807 |
| East Orange City, New Jersey | 0.1465 | -0.4304 | 1.5362 | -0.3594 |
| Jersey City City, New Jersey | -1.4842 | -0.1703 | -2.2760 | -0.0879 |
| Trenton City, New Jersey | -2.4293 | -0.4616 | -3.6327 | -0.2496 |
| Paterson City, New Jersey | -1.4976 | -0.2306 | -2.7672 | 0.0217 |
| Elizabeth City, New Jersey | -1.3636 | -0.1904 | 0.3348 | -0.4683 |
| Plainfield City, New Jersey | -1.8379 | -0.2024 | -1.7841 | 0.0320 |
| Newark City, New Jersey | -1.7702 | -0.1400 | -1.3407 | -0.2567 |
| Albuquerque City, New Mexico | -0.4843 | -0.1694 | -0.0505 | -0.2643 |
| Las Vegas City, Nevada | 0.3988 | -0.0320 | 2.2448 | 0.1093 |
| Albany City, New York | -0.4635 | -0.2376 | 0.7614 | -0.5588 |
| Buffalo City, New York | -0.7712 | -0.0028 | -0.2172 | -0.2211 |
| Rochester City, New York | 0.5306 | -0.0817 | 3.6892 | -0.2140 |
| New York City, New York | 1.3302 | 0.1974 | 1.7744 | 0.2756 |
| Syracuse City, New York | -0.7515 | -0.1766 | -3.5265 | -0.1190 |
| Mount Vernon City, New York | -1.3685 | -0.1516 | -1.2282 | -0.1748 |

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Table A13 – *Continued from previous page*

| City | Overall | | Black | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Yonkers City, New York | -1.0870 | -0.2240 | 0.1920 | -0.2394 |
| Lima City, Ohio | 1.0231 | -0.0808 | 0.8766 | 0.4398 |
| Toledo City, Ohio | 0.1749 | -0.0094 | -2.0070 | 0.3243 |
| Dayton City, Ohio | 0.2841 | 0.3473 | -2.3951 | 0.4929 |
| Cleveland City, Ohio | 2.0951 | 0.3417 | -2.1040 | 0.7810 |
| Columbus City, Ohio | 0.0183 | -0.0187 | 0.6808 | 0.1480 |
| Lawton City, Oklahoma | -0.9167 | -0.1170 | -2.8550 | 0.0031 |
| Oklahoma City City, Oklahoma | -1.1800 | -0.1638 | -1.5141 | -0.0233 |
| Tulsa City, Oklahoma | -1.6389 | -0.1876 | -3.5476 | -0.0486 |
| Portland City, Oregon | 0.2001 | -0.1214 | 3.9005 | -0.0986 |
| Harrisburg City, Pennsylvania | -1.0098 | 0.2155 | -2.8735 | -0.1676 |
| Chester City, Pennsylvania | -0.6054 | 0.7096 | -7.2825 | 0.2615 |
| Erie City, Pennsylvania | -0.7211 | -0.2048 | -5.0005 | 0.0651 |
| Philadelphia City, Pennsylvania | 0.6749 | 0.1452 | 2.7072 | -0.2210 |
| Providence City, Rhode Island | -0.2922 | -0.2506 | 3.9770 | -0.9578 |
| Charleston City, South Carolina | -2.5589 | -0.2547 | -1.8711 | -0.2667 |
| North Charleston City, South Carolina | 0.3957 | 0.0498 | -2.5303 | -0.1061 |
| Greenville City, South Carolina | 0.3888 | -0.1089 | 0.4021 | 0.1599 |
| Columbia City, South Carolina | 0.1116 | -0.0758 | 0.6181 | -0.0802 |
| Spartanburg City, South Carolina | 1.0195 | 0.1538 | 3.8352 | -0.0001 |
| Sumter City, South Carolina | 0.3490 | 0.0723 | -1.0118 | -0.0191 |
| Killeen City, Texas | -1.0361 | 0.1126 | -1.6578 | 0.1826 |

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Table A13 – *Continued from previous page*

| City | Overall | | Black | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Garland City, Texas | -0.7952 | -0.1860 | -0.8393 | 0.0174 |
| Grand Prairie City, Texas | -0.5874 | -0.2571 | 1.5578 | -0.0171 |
| Irving City, Texas | -0.9808 | -0.2247 | -2.3597 | 0.2302 |
| Mesquite City, Texas | -0.6698 | -0.2608 | -2.8063 | -0.1232 |
| El Paso City, Texas | -0.7968 | -0.1476 | -0.5999 | -0.0713 |
| Texas City City, Texas | -1.2977 | -0.1364 | 1.0892 | -0.0138 |
| Longview City, Texas | -1.6207 | -0.1239 | -3.6604 | 0.6110 |
| Beaumont City, Texas | 0.0472 | -0.0124 | -1.4832 | 0.1680 |
| Port Arthur City, Texas | -0.7510 | -0.1144 | -2.2038 | -0.0014 |
| Lubbock City, Texas | -0.9525 | -0.2856 | -2.2845 | 0.3082 |
| Waco City, Texas | 0.6359 | 0.0482 | 2.6900 | 0.2959 |
| Corpus Christi City, Texas | -0.7102 | -0.2091 | -4.9543 | 0.5945 |
| Amarillo City, Texas | -0.7196 | -0.1858 | 1.8688 | 0.6808 |
| Tyler City, Texas | -0.2639 | -0.1764 | -0.3000 | 0.0814 |
| Arlington City, Texas | -0.9823 | -0.2660 | -2.7242 | 0.2240 |
| Fort Worth City, Texas | 0.8115 | 0.1261 | 0.9413 | 0.6218 |
| Austin City, Texas | -1.2300 | -0.3015 | -2.1149 | 0.2071 |
| Wichita Falls City, Texas | -0.1578 | -0.2383 | 1.4148 | 0.0137 |
| Dallas City, Texas | 2.1099 | 0.2092 | 1.4548 | 0.4352 |
| San Antonio City, Texas | 0.2295 | 0.0593 | -0.1727 | 0.5807 |
| Danville City, Virginia | -0.7472 | 0.1004 | -1.3274 | -0.1391 |
| Hampton City, Virginia | -0.5279 | -0.1038 | -2.1309 | -0.0643 |

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Table A13 – *Continued from previous page*

| | Overall | | Black | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Newport News City, Virginia | -0.9104 | -0.0938 | -1.7080 | -0.1173 |
| Norfolk City, Virginia | 1.3435 | 0.3590 | 1.5035 | 0.1286 |
| Petersburg City, Virginia | -0.0643 | 0.1263 | -2.4573 | 0.0559 |
| Portsmouth City, Virginia | 1.5727 | 0.4401 | 0.9764 | 0.2286 |
| Richmond City, Virginia | 9.1607 | 0.7899 | 9.2650 | 0.0609 |
| Roanoke City, Virginia | -0.3466 | -0.1983 | 0.1451 | -0.0722 |
| Suffolk City, Virginia | -0.1134 | -0.1045 | 0.4816 | -0.0011 |
| Virginia Beach City, Virginia | -0.8412 | -0.1592 | -0.5646 | -0.1294 |
| Tacoma City, Washington | 0.6235 | 0.0329 | 3.1543 | -0.0479 |
| Seattle City, Washington | -0.3583 | -0.1098 | -0.5854 | 0.1612 |

### A4.18 City-Level Black Non-Gun Homicide Implied Weights

| City | Kansas City | St. Louis |
|---|---|---|
| Pine Bluff City, Arkansas | 0.132024167 | 0.383381119 |
| Little Rock City, Arkansas | -0.137639425 | -0.399687104 |
| North Little Rock City, Arkansas | 0.405321995 | 1.177002693 |
| Phoenix City, Arizona | -0.297172112 | -0.862949408 |
| Tucson City, Arizona | -0.056829542 | -0.165025646 |
| Berkeley City, California | 0.1042103 | 0.302613243 |
| Hayward City, California | 0.269631399 | 0.782974736 |
| Oakland City, California | -0.007888582 | -0.022907422 |
| Pittsburg City, California | -2.533843591 | -7.357954327 |
| Richmond City, California | 0.059289495 | 0.172169031 |
| Fresno City, California | 0.435312458 | 1.264091121 |
| Bakersfield City, California | 0.00771888 | 0.022414629 |
| Compton City, California | 0.172725795 | 0.501573385 |
| Inglewood City, California | -0.160176478 | -0.465131791 |
| Long Beach City, California | 0.157108395 | 0.456222477 |
| Los Angeles City, California | -0.266172497 | -0.772930532 |
| Palmdale City, California | 0.474736088 | 1.378572246 |
| Pasadena City, California | 0.035348109 | 0.102646341 |
| Pomona City, California | 0.188710096 | 0.54798973 |
| Carson City, California | -0.044622379 | -0.12957762 |
| Riverside City, California | -0.094483507 | -0.274367893 |
| Sacramento City, California | 0.192388581 | 0.558671575 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Fontana City, California | -0.326067985 | -0.946859288 |
| Ontario City, California | 0.364935399 | 1.059725235 |
| Rialto City, California | 0.184458765 | 0.535644415 |
| San Bernardino City, California | 0.401708069 | 1.166508318 |
| San Diego City, California | 0.110647207 | 0.321305188 |
| San Francisco City, California | 0.101156093 | 0.293744222 |
| Stockton City, California | -0.966950261 | -2.807898593 |
| San Jose City, California | 0.179608864 | 0.521560928 |
| Fairfield City, California | 0.145763718 | 0.423278998 |
| Vallejo City, California | 0.063812068 | 0.185301998 |
| Aurora City, Colorado | -0.256115687 | -0.743726857 |
| Colorado Springs City, Colorado | -0.061593178 | -0.178858628 |
| Denver City, Colorado | 0.067542676 | 0.196135202 |
| Bridgeport City, Connecticut | 0.154528414 | 0.448730544 |
| Hartford City, Connecticut | 0.009418943 | 0.027351392 |
| Waterbury City, Connecticut | 0.320624145 | 0.931051082 |
| Wilmington City, Delaware | 0.079359658 | 0.23045019 |
| Savannah City, Georgia | -0.03539639 | -0.102786543 |
| Albany City, Georgia | 0.069541689 | 0.201940079 |
| Valdosta City, Georgia | 0.121629101 | 0.35319519 |
| Atlanta City, Georgia | 0.215046274 | 0.624466587 |
| Shreveport City, Louisiana | 0.029238258 | 0.084904121 |
| Baton Rouge City, Louisiana | -0.13799369 | -0.400715842 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Lafayette City, Louisiana | 0.529496151 | 1.537588392 |
| Alexandria City, Louisiana | 0.271364666 | 0.788007919 |
| Springfield City, Massachusetts | -0.143501686 | -0.416710351 |
| Boston City, Massachusetts | 0.032076763 | 0.093146775 |
| Baltimore City, Maryland | 0.096195446 | 0.279339143 |
| Flint City, Michigan | 0.316757061 | 0.919821569 |
| Lansing City, Michigan | -0.17724198 | -0.514687805 |
| Grand Rapids City, Michigan | 0.002663437 | 0.007734276 |
| Saginaw City, Michigan | 0.259403606 | 0.753274549 |
| Detroit City, Michigan | -0.098555879 | -0.286193536 |
| St. Paul City, Minnesota | -0.138426438 | -0.401972486 |
| Gulfport City, Mississippi | -0.285960832 | -0.830393299 |
| Jackson City, Mississippi | 0.161712159 | 0.469591212 |
| Meridian City, Mississippi | -0.293658639 | -0.852746737 |
| Vicksburg City, Mississippi | -0.112119536 | -0.325580643 |
| Asheville City, North Carolina | 0.123795443 | 0.359485969 |
| Fayetteville City, North Carolina | 0.377203601 | 1.095350509 |
| Durham City, North Carolina | 0.064028407 | 0.185930218 |
| Rocky Mount City, North Carolina | 0.061885233 | 0.179706718 |
| Winston-Salem City, North Carolina | 0.215284092 | 0.62515718 |
| Gastonia City, North Carolina | 0.259755557 | 0.754296569 |
| Greensboro City, North Carolina | 0.09078435 | 0.263626019 |
| High Point City, North Carolina | 0.183124206 | 0.531769027 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Charlotte City, North Carolina | 0.157607966 | 0.457673165 |
| Wilmington City, North Carolina | -0.065203638 | -0.189342938 |
| Goldsboro City, North Carolina | 0.161851947 | 0.469997137 |
| Atlantic City City, New Jersey | 0.341808897 | 0.992568864 |
| East Orange City, New Jersey | 0.023011943 | 0.066823708 |
| Jersey City City, New Jersey | -0.437221718 | -1.269635364 |
| Trenton City, New Jersey | 0.276972221 | 0.804291535 |
| Paterson City, New Jersey | -0.167044032 | -0.485074282 |
| Elizabeth City, New Jersey | 0.708764348 | 2.058160068 |
| Plainfield City, New Jersey | 0.15429096 | 0.448041009 |
| Newark City, New Jersey | 0.102509949 | 0.297675644 |
| Albuquerque City, New Mexico | 0.578213721 | 1.67905792 |
| Las Vegas City, Nevada | -0.352163887 | -1.022638416 |
| Albany City, New York | 0.164616797 | 0.478025905 |
| Buffalo City, New York | -0.10398553 | -0.301960541 |
| Rochester City, New York | 0.005488897 | 0.015939047 |
| New York City, New York | -0.066655313 | -0.193558414 |
| Syracuse City, New York | 0.124601322 | 0.361826137 |
| Mount Vernon City, New York | -0.065550818 | -0.190351105 |
| Yonkers City, New York | -0.449721672 | -1.305933615 |
| Lima City, Ohio | -0.316427087 | -0.918863366 |
| Toledo City, Ohio | -0.165759347 | -0.481343722 |
| Dayton City, Ohio | 0.14464107 | 0.420018975 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Cleveland City, Ohio | 0.03196765 | 0.092829923 |
| Columbus City, Ohio | 0.039660859 | 0.115170009 |
| Lawton City, Oklahoma | -0.564675709 | -1.639745282 |
| Oklahoma City City, Oklahoma | 0.189709873 | 0.550892953 |
| Tulsa City, Oklahoma | 0.040866622 | 0.118671388 |
| Portland City, Oregon | -0.095424535 | -0.277100519 |
| Harrisburg City, Pennsylvania | -0.004902635 | -0.014236619 |
| Chester City, Pennsylvania | -0.007906509 | -0.022959479 |
| Erie City, Pennsylvania | 0.111812443 | 0.324688884 |
| Philadelphia City, Pennsylvania | -0.077977591 | -0.226436848 |
| Providence City, Rhode Island | -0.402791657 | -1.169654916 |
| Charleston City, South Carolina | 0.364022565 | 1.057074485 |
| North Charleston City, South Carolina | -0.34886918 | -1.013071012 |
| Greenville City, South Carolina | -0.042563995 | -0.123600342 |
| Columbia City, South Carolina | -0.166398616 | -0.483200078 |
| Spartanburg City, South Carolina | -0.079614547 | -0.231190355 |
| Sumter City, South Carolina | 0.076282359 | 0.221514113 |
| Killeen City, Texas | -0.330030628 | -0.958366292 |
| Garland City, Texas | -0.206082345 | -0.598436496 |
| Grand Prairie City, Texas | -0.189192673 | -0.549391072 |
| Irving City, Texas | -0.376577429 | -1.093532188 |
| Mesquite City, Texas | -0.009019853 | -0.026192488 |
| El Paso City, Texas | -0.068541377 | -0.1990353 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Texas City City, Texas | -0.034905877 | -0.101362154 |
| Longview City, Texas | 0.351860518 | 1.021757473 |
| Beaumont City, Texas | -0.074772456 | -0.217129549 |
| Port Arthur City, Texas | -0.01130658 | -0.032832848 |
| Lubbock City, Texas | -0.323572035 | -0.939611371 |
| Waco City, Texas | 0.258293293 | 0.750050342 |
| Corpus Christi City, Texas | -0.337764167 | -0.98082349 |
| Amarillo City, Texas | -0.601757174 | -1.747425066 |
| Tyler City, Texas | -0.149787031 | -0.434962181 |
| Arlington City, Texas | 0.210645817 | 0.611688229 |
| Fort Worth City, Texas | 0.051135414 | 0.148490633 |
| Austin City, Texas | -0.197625729 | -0.573879576 |
| Wichita Falls City, Texas | -0.683823892 | -1.985736209 |
| Dallas City, Texas | -0.001398722 | -0.004061708 |
| San Antonio City, Texas | -0.217705089 | -0.632187444 |
| Danville City, Virginia | -0.121658507 | -0.35328058 |
| Hampton City, Virginia | 0.028244273 | 0.082017719 |
| Newport News City, Virginia | -0.13257924 | -0.384992979 |
| Norfolk City, Virginia | 0.327771329 | 0.95180558 |
| Petersburg City, Virginia | -0.031778162 | -0.092279675 |
| Portsmouth City, Virginia | 0.263260017 | 0.764473068 |
| Richmond City, Virginia | -0.036317118 | -0.105460218 |
| Roanoke City, Virginia | 0.327011283 | 0.949598505 |

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Table A14 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Suffolk City, Virginia | 0.028025851 | 0.08138345 |
| Virginia Beach City, Virginia | 0.132675536 | 0.38527261 |
| Tacoma City, Washington | 0.083763377 | 0.243238023 |
| Seattle City, Washington | 0.175124033 | 0.50853756 |

### A4.19 City-Level Black Arrest Implied Weights

| | Aggravated Assault | | Weapons | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Pine Bluff City, Arkansas | -0.4941 | 0.2177 | -0.2531 | 0.3969 |
| Little Rock City, Arkansas | 1.0897 | -0.4465 | 0.2079 | -0.4664 |
| North Little Rock City, Arkansas | -1.1893 | 0.3754 | 1.1424 | -1.3240 |
| Phoenix City, Arizona | 1.2601 | -0.3419 | 0.1951 | -0.0226 |
| Tucson City, Arizona | 0.5603 | -0.2320 | -0.0036 | 0.0470 |
| Berkeley City, California | 2.5873 | -0.8668 | -0.0801 | 0.3166 |
| Hayward City, California | 1.7416 | -0.7204 | -0.1023 | 0.1547 |
| Oakland City, California | 0.3224 | -0.1100 | 0.3702 | -0.4795 |
| Pittsburg City, California | 1.0566 | -0.3459 | 0.0446 | -0.3164 |
| Richmond City, California | -0.0343 | 0.0529 | 0.4569 | -0.5545 |
| Fresno City, California | 0.2807 | -0.1682 | 0.0697 | -0.2794 |
| Bakersfield City, California | -0.3981 | -0.0114 | -0.1082 | -0.6520 |
| Compton City, California | 0.0046 | -0.0588 | 0.0884 | -1.0483 |
| Inglewood City, California | -0.6474 | 0.1544 | -0.0569 | -0.0907 |
| Long Beach City, California | 1.0118 | -0.4047 | 0.1014 | -0.6037 |
| Los Angeles City, California | 0.3962 | -0.1651 | -0.0367 | -0.0510 |
| Palmdale City, California | 1.1517 | -0.4277 | 0.0386 | -0.4334 |
| Pasadena City, California | 1.6256 | -0.6299 | -0.0130 | -0.0229 |
| Pomona City, California | 1.9683 | -0.6961 | 0.0332 | -0.1716 |
| Carson City, California | -0.5697 | 0.1733 | -0.0801 | 0.1327 |
| Riverside City, California | 0.8817 | -0.2713 | 0.3853 | -0.5905 |

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Table A15 – *Continued from previous page*

| | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Sacramento City, California | -0.2150 | 0.0451 | -0.0132 | 0.0537 |
| Fontana City, California | 2.1505 | -0.7421 | -0.2859 | 0.4817 |
| Ontario City, California | 2.8121 | -0.8324 | 0.2007 | -0.3555 |
| Rialto City, California | 0.3164 | -0.2114 | 0.1086 | -0.1186 |
| San Bernardino City, California | 0.9612 | -0.2554 | -0.1370 | 0.2210 |
| San Diego City, California | 0.7159 | -0.3006 | 0.0037 | -0.1192 |
| San Francisco City, California | 0.1636 | -0.2813 | 0.0199 | -0.3467 |
| Stockton City, California | -0.8636 | 0.2378 | 0.0621 | -0.0540 |
| San Jose City, California | 0.2914 | -0.1575 | 0.0063 | -0.1847 |
| Fairfield City, California | 0.1213 | 0.0359 | -0.1421 | 0.1206 |
| Vallejo City, California | 3.0800 | -1.0309 | 0.0717 | 0.3347 |
| Aurora City, Colorado | 6.3628 | -2.0008 | 1.1103 | -2.2183 |
| Colorado Springs City, Colorado | -0.2345 | 0.1040 | 1.0457 | -1.5349 |
| Denver City, Colorado | 0.0268 | 0.1012 | 0.3800 | 0.5314 |
| Bridgeport City, Connecticut | -1.1889 | 0.3396 | 0.0385 | -0.0803 |
| Hartford City, Connecticut | -0.0033 | -0.0217 | -0.2509 | 0.0508 |
| Waterbury City, Connecticut | -1.2364 | 0.3326 | 0.2606 | 0.5703 |
| Wilmington City, Delaware | -2.3464 | 0.7733 | -0.2907 | 0.0918 |
| Savannah City, Georgia | -0.9792 | 0.3550 | 0.0875 | -0.4609 |
| Albany City, Georgia | 1.8044 | -0.3235 | 0.0432 | -0.1829 |
| Valdosta City, Georgia | -3.9985 | 1.1149 | 0.1683 | -1.0950 |
| Atlanta City, Georgia | 1.2656 | -0.5972 | 0.7823 | -2.1370 |

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Table A15 – *Continued from previous page*

| City | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Shreveport City, Louisiana | -1.1354 | 0.3318 | -0.0279 | 0.1084 |
| Baton Rouge City, Louisiana | 0.6778 | -0.2276 | -0.2010 | 0.1899 |
| Lafayette City, Louisiana | -1.6497 | 0.4271 | -0.2337 | 0.2860 |
| Alexandria City, Louisiana | -0.3462 | 0.2038 | -0.4187 | 0.1108 |
| Springfield City, Massachusetts | 3.9167 | -1.3899 | 0.1027 | 0.1212 |
| Boston City, Massachusetts | 0.4497 | -0.1967 | -0.0862 | 0.1318 |
| Baltimore City, Maryland | -0.7381 | 0.2799 | -0.1807 | 0.1938 |
| Flint City, Michigan | -0.2291 | 0.1082 | -0.2165 | 0.4226 |
| Lansing City, Michigan | 0.7263 | -0.1861 | -0.0003 | 0.4991 |
| Grand Rapids City, Michigan | 1.2230 | -0.3678 | -0.2464 | 0.8059 |
| Saginaw City, Michigan | -1.4407 | 0.4597 | -0.1778 | -0.0836 |
| Detroit City, Michigan | -0.5560 | 0.1830 | -0.0678 | 0.1592 |
| St. Paul City, Minnesota | 1.6486 | -0.5310 | -1.4925 | 3.4525 |
| Gulfport City, Mississippi | -1.1318 | 0.3131 | -0.4099 | 0.8135 |
| Jackson City, Mississippi | -0.6421 | 0.2033 | 0.0567 | 0.0390 |
| Meridian City, Mississippi | -0.7098 | 0.3120 | -0.1022 | 0.2158 |
| Vicksburg City, Mississippi | -2.7227 | 0.9398 | -0.3136 | 0.4000 |
| Asheville City, North Carolina | 2.2236 | -0.7625 | -0.4017 | 0.4965 |
| Fayetteville City, North Carolina | -1.1662 | 0.3582 | 0.3422 | -0.2920 |
| Durham City, North Carolina | -0.7072 | 0.2189 | -0.0178 | -0.5465 |
| Rocky Mount City, North Carolina | -1.2095 | 0.2152 | -0.0253 | -0.3811 |
| Winston-Salem City, North Carolina | 0.1051 | -0.0726 | -0.1414 | 0.8336 |

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Table A15 – *Continued from previous page*

| | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Gastonia City, North Carolina | 9.4916 | -3.0342 | -0.4084 | 0.6344 |
| Greensboro City, North Carolina | -0.4292 | 0.0989 | 0.0863 | 0.2625 |
| High Point City, North Carolina | -1.9374 | 0.5062 | 0.0003 | 0.0953 |
| Charlotte City, North Carolina | 2.4354 | -0.8292 | 0.0575 | -0.1193 |
| Wilmington City, North Carolina | -0.3694 | 0.0124 | -0.2927 | 0.0572 |
| Goldsboro City, North Carolina | 0.1272 | -0.0989 | -0.2879 | -0.0211 |
| Atlantic City City, New Jersey | -0.6081 | 0.0465 | 0.1433 | -0.8829 |
| East Orange City, New Jersey | -0.4405 | 0.1632 | -0.0315 | -0.3044 |
| Jersey City City, New Jersey | 0.4216 | -0.2005 | -0.1140 | 0.0276 |
| Trenton City, New Jersey | -0.8282 | 0.3125 | -0.4996 | 0.3471 |
| Paterson City, New Jersey | -0.2461 | 0.0584 | -0.1121 | -0.0462 |
| Elizabeth City, New Jersey | -1.0396 | 0.3427 | -0.0332 | -0.5221 |
| Plainfield City, New Jersey | -0.7952 | 0.2045 | -0.1334 | -0.5460 |
| Newark City, New Jersey | 0.6847 | -0.2081 | -0.1900 | -0.3941 |
| Albuquerque City, New Mexico | -0.3488 | 0.1936 | 0.0111 | 0.1767 |
| Las Vegas City, Nevada | -2.7523 | 1.0925 | -0.1183 | 0.6045 |
| Albany City, New York | -0.4548 | 0.0422 | 0.0614 | -0.9349 |
| Buffalo City, New York | -1.2785 | 0.4264 | -0.2029 | 0.3003 |
| Rochester City, New York | -1.2907 | 0.4458 | 0.0454 | 0.1573 |
| Syracuse City, New York | -0.3640 | 0.0337 | -0.5568 | 1.1694 |
| Mount Vernon City, New York | -1.3378 | 0.4207 | -0.1545 | -0.0300 |
| Yonkers City, New York | -1.2111 | 0.3564 | -0.0271 | -0.9594 |

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Table A15 – *Continued from previous page*

| City | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Lima City, Ohio | 4.5604 | -0.4141 | -0.1781 | 0.8543 |
| Toledo City, Ohio | -0.0512 | 0.0929 | -0.0621 | 0.6823 |
| Dayton City, Ohio | -0.7266 | 0.2798 | -0.0297 | -0.3205 |
| Cleveland City, Ohio | -0.6954 | 0.2328 | 0.0727 | -0.1370 |
| Columbus City, Ohio | 1.9282 | -0.7241 | -0.0293 | 0.3972 |
| Lawton City, Oklahoma | 0.2306 | -0.0978 | -0.0138 | -0.5270 |
| Oklahoma City City, Oklahoma | -1.2992 | 0.4145 | 0.2500 | -0.8282 |
| Tulsa City, Oklahoma | -0.1937 | 0.0231 | 0.0581 | -0.3020 |
| Portland City, Oregon | -0.5933 | 0.1326 | 0.4006 | 0.1214 |
| Harrisburg City, Pennsylvania | 0.3390 | -0.1437 | -0.4304 | 0.2822 |
| Chester City, Pennsylvania | 0.9555 | -0.4591 | -0.1901 | 0.0103 |
| Erie City, Pennsylvania | -0.3233 | 0.1236 | -0.3241 | 0.3610 |
| Philadelphia City, Pennsylvania | -1.6006 | 0.5031 | -0.1318 | -0.0887 |
| Providence City, Rhode Island | 0.1786 | -0.0855 | -0.2328 | 0.3397 |
| Charleston City, South Carolina | -0.6634 | 0.2373 | -0.4912 | 0.8686 |
| North Charleston City, South Carolina | -1.1056 | 0.3164 | -0.4725 | 0.4851 |
| Greenville City, South Carolina | -0.0811 | 0.0321 | -0.2993 | 0.7319 |
| Columbia City, South Carolina | -0.6166 | 0.1770 | -0.7391 | 1.7347 |
| Spartanburg City, South Carolina | 0.1986 | -0.0627 | -0.2613 | 0.7631 |
| Sumter City, South Carolina | -0.8773 | 0.2627 | -0.3442 | 0.5528 |
| Killeen City, Texas | -0.5655 | 0.1751 | 0.1628 | -0.4278 |
| Garland City, Texas | 0.7013 | -0.2803 | -0.3012 | 1.0144 |

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Table A15 – *Continued from previous page*

| City | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| | Kansas City | St. Louis | Kansas City | St. Louis |
| Grand Prairie City, Texas | 0.5170 | -0.2051 | 0.4249 | -0.3993 |
| Irving City, Texas | -0.2968 | 0.0595 | -0.0277 | 0.1448 |
| Mesquite City, Texas | -0.3914 | 0.0331 | 0.1608 | -0.0731 |
| El Paso City, Texas | -0.1498 | 0.0051 | 0.2175 | -0.3299 |
| Texas City City, Texas | -3.6797 | 1.1739 | 1.1058 | -1.7189 |
| Longview City, Texas | -0.6723 | 0.1660 | 0.1504 | -0.3554 |
| Beaumont City, Texas | -0.6512 | 0.2400 | -0.0703 | 0.3799 |
| Port Arthur City, Texas | -0.5202 | 0.1675 | 0.3250 | -0.4115 |
| Lubbock City, Texas | -1.5683 | 0.4910 | 0.3808 | -0.6570 |
| Waco City, Texas | -0.1618 | 0.0560 | 0.2653 | -0.2611 |
| Corpus Christi City, Texas | -0.0107 | 0.0326 | 0.0979 | -0.1751 |
| Amarillo City, Texas | -0.1796 | 0.0602 | 0.0710 | 0.1457 |
| Tyler City, Texas | -0.3734 | 0.1110 | -0.1818 | 0.3833 |
| Arlington City, Texas | -1.7120 | 0.3929 | 0.0512 | -0.1856 |
| Fort Worth City, Texas | 0.2000 | -0.0463 | 0.2829 | -0.1777 |
| Austin City, Texas | -0.6096 | 0.2499 | 0.3977 | -0.8345 |
| Wichita Falls City, Texas | -0.3438 | 0.0526 | -0.0563 | 0.3536 |
| Dallas City, Texas | 0.0938 | -0.0404 | 0.3771 | -0.6995 |
| San Antonio City, Texas | -1.0826 | 0.3712 | 0.1795 | -0.3393 |
| Danville City, Virginia | -1.3638 | 0.5072 | -0.0194 | 0.3724 |
| Hampton City, Virginia | -0.5166 | 0.1558 | -0.2162 | 0.4915 |
| Newport News City, Virginia | 1.1430 | -0.3484 | 0.0903 | -0.3843 |

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Table A15 – *Continued from previous page*

| | Aggravated Asault | | Weapons | |
|---|---|---|---|---|
| City | Kansas City | St. Louis | Kansas City | St. Louis |
| Norfolk City, Virginia | 0.9299 | -0.2316 | 0.1887 | 0.3529 |
| Petersburg City, Virginia | 0.4828 | -0.1263 | 0.1945 | -0.0301 |
| Portsmouth City, Virginia | -0.7013 | 0.2623 | -0.0876 | 0.2624 |
| Richmond City, Virginia | -0.3354 | 0.1140 | -0.0194 | 0.6861 |
| Roanoke City, Virginia | -1.7437 | 0.5612 | -0.3077 | 1.0026 |
| Suffolk City, Virginia | -0.8642 | 0.3171 | 0.0493 | 0.0918 |
| Virginia Beach City, Virginia | -0.3670 | 0.0877 | -0.2548 | 0.5245 |
| Tacoma City, Washington | 0.2831 | -0.0524 | 0.3578 | 0.2818 |
| Seattle City, Washington | -1.6802 | 0.6802 | -0.1930 | -0.5666 |

### A4.20 City-Level Officer Gun Assault Implied Weights

| City | Kansas City | St. Louis |
|---|---|---|
| Pine Bluff City, Arkansas | -1.3387 | 0.3149 |
| Little Rock City, Arkansas | 3.2546 | -0.0821 |
| North Little Rock City, Arkansas | 0.0202 | 0.0217 |
| Phoenix City, Arizona | 0.1168 | -0.0841 |
| Tucson City, Arizona | -0.4318 | 0.2021 |
| Berkeley City, California | -1.4890 | 0.2268 |
| Hayward City, California | -0.9512 | 0.1706 |
| Oakland City, California | 0.0702 | -0.0126 |
| Pittsburg City, California | -1.7044 | 0.1695 |
| Richmond City, California | 4.1197 | -0.2325 |
| Fresno City, California | 0.3391 | 0.1876 |
| Bakersfield City, California | -2.2233 | 0.3078 |
| Inglewood City, California | 14.9868 | -2.4965 |
| Long Beach City, California | 0.5630 | 0.0239 |
| Los Angeles City, California | 1.1157 | -0.1257 |
| Pasadena City, California | 3.4085 | -0.4577 |
| Pomona City, California | -1.5059 | 0.1790 |
| Riverside City, California | 2.6676 | -0.2041 |
| Sacramento City, California | -0.8414 | 0.1507 |
| Fontana City, California | 3.2629 | -0.4185 |
| Ontario City, California | 0.8678 | 0.0376 |
| Rialto City, California | 0.3038 | -0.4565 |

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Table A16 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| San Bernardino City, California | -3.4850 | 0.3746 |
| San Diego City, California | -0.7435 | 0.1336 |
| San Francisco City, California | -0.4990 | 0.0556 |
| Stockton City, California | 0.0748 | -0.1156 |
| San Jose City, California | -1.0694 | 0.0931 |
| Fairfield City, California | 1.1269 | -0.2187 |
| Vallejo City, California | 5.7884 | -1.8938 |
| Aurora City, Colorado | 0.7633 | -0.1394 |
| Colorado Springs City, Colorado | -1.5757 | 0.1802 |
| Denver City, Colorado | -0.8244 | 0.0951 |
| Bridgeport City, Connecticut | -0.6557 | 0.0888 |
| Hartford City, Connecticut | -0.0944 | 0.0239 |
| Waterbury City, Connecticut | -0.5592 | 0.0726 |
| Wilmington City, Delaware | -0.1083 | -0.0343 |
| Savannah City, Georgia | -0.3939 | 0.0585 |
| Albany City, Georgia | -0.2847 | 0.0448 |
| Valdosta City, Georgia | 0.3876 | -0.0842 |
| Atlanta City, Georgia | 0.5025 | -0.0184 |
| Shreveport City, Louisiana | -1.2195 | 0.1802 |
| Baton Rouge City, Louisiana | -1.0266 | 0.0991 |
| Lafayette City, Louisiana | -4.7340 | 0.9456 |
| Alexandria City, Louisiana | -0.9357 | 0.1415 |
| Springfield City, Massachusetts | -0.9746 | 0.1190 |

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Table A16 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Boston City, Massachusetts | -0.6180 | 0.0508 |
| Baltimore City, Maryland | 1.1459 | -0.0924 |
| Flint City, Michigan | -1.3329 | 0.2563 |
| Lansing City, Michigan | -0.6076 | 0.0948 |
| Grand Rapids City, Michigan | -0.8430 | 0.1141 |
| Saginaw City, Michigan | -0.8435 | 0.1048 |
| Detroit City, Michigan | -0.4631 | 0.0338 |
| St. Paul City, Minnesota | 0.7770 | -0.1801 |
| Gulfport City, Mississippi | -2.0580 | 0.4551 |
| Meridian City, Mississippi | 0.4567 | 0.0213 |
| Vicksburg City, Mississippi | -1.6983 | 0.3476 |
| Asheville City, North Carolina | -0.0769 | 0.0470 |
| Fayetteville City, North Carolina | 0.9678 | -0.2227 |
| Durham City, North Carolina | -1.0016 | 0.2169 |
| Rocky Mount City, North Carolina | 0.2284 | -0.1961 |
| Winston-Salem City, North Carolina | 0.8168 | -0.1694 |
| Gastonia City, North Carolina | -0.3970 | 0.0696 |
| Greensboro City, North Carolina | 1.4818 | -0.2437 |
| High Point City, North Carolina | -0.5344 | 0.1526 |
| Charlotte City, North Carolina | 1.3783 | -0.2350 |
| Wilmington City, North Carolina | 0.8098 | -0.1128 |
| Goldsboro City, North Carolina | 3.7099 | -0.8164 |
| Atlantic City City, New Jersey | -0.2547 | 0.0588 |

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Table A16 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| East Orange City, New Jersey | 1.2869 | -0.0902 |
| Jersey City City, New Jersey | -0.2785 | -0.0020 |
| Trenton City, New Jersey | -0.3075 | -0.0046 |
| Paterson City, New Jersey | -0.5092 | 0.0373 |
| Elizabeth City, New Jersey | -0.1978 | 0.0632 |
| Plainfield City, New Jersey | -1.9880 | 0.3613 |
| Newark City, New Jersey | 1.1806 | -0.2098 |
| Las Vegas City, Nevada | -0.8261 | 0.0192 |
| Albany City, New York | 1.0393 | -0.2045 |
| Buffalo City, New York | 0.0923 | -0.0527 |
| Rochester City, New York | -0.6518 | 0.1175 |
| New York City, New York | 1.8513 | -0.1762 |
| Syracuse City, New York | -0.0491 | -0.0113 |
| Mount Vernon City, New York | 0.2856 | -0.0446 |
| Yonkers City, New York | 0.2735 | -0.0475 |
| Toledo City, Ohio | -0.3928 | -0.0347 |
| Dayton City, Ohio | 0.5610 | -0.0380 |
| Cleveland City, Ohio | -0.2042 | 0.1962 |
| Columbus City, Ohio | -0.2975 | 0.1305 |
| Lawton City, Oklahoma | -0.3048 | -0.0069 |
| Oklahoma City City, Oklahoma | -2.5541 | 0.3445 |
| Tulsa City, Oklahoma | 0.1168 | -0.0808 |
| Portland City, Oregon | -0.5679 | 0.1071 |

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Table A16 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Harrisburg City, Pennsylvania | -0.5865 | 0.0161 |
| Chester City, Pennsylvania | -1.0124 | -0.0803 |
| Erie City, Pennsylvania | 0.1634 | -0.0848 |
| Philadelphia City, Pennsylvania | -1.1033 | 0.0889 |
| Providence City, Rhode Island | -0.1692 | 0.0475 |
| Charleston City, South Carolina | -2.0300 | 0.2894 |
| North Charleston City, South Carolina | -0.6075 | -0.0376 |
| Greenville City, South Carolina | 0.5659 | -0.2042 |
| Columbia City, South Carolina | 0.2190 | -0.0716 |
| Spartanburg City, South Carolina | -1.6423 | 0.2055 |
| Sumter City, South Carolina | 1.5599 | -0.1579 |
| Killeen City, Texas | -0.6637 | 0.0504 |
| Garland City, Texas | 0.1065 | -0.0071 |
| Grand Prairie City, Texas | 1.8876 | -0.2895 |
| Irving City, Texas | -0.2740 | 0.0429 |
| Mesquite City, Texas | -0.3795 | 0.1543 |
| El Paso City, Texas | 0.7431 | -0.1511 |
| Texas City City, Texas | -1.0967 | 0.2253 |
| Longview City, Texas | -0.4310 | 0.1469 |
| Port Arthur City, Texas | -0.6315 | 0.0014 |
| Lubbock City, Texas | 0.1535 | -0.0564 |
| Waco City, Texas | -1.0663 | 0.1862 |
| Corpus Christi City, Texas | -0.7134 | 0.0442 |

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Table A16 – *Continued from previous page*

| City | Kansas City | St. Louis |
|---|---|---|
| Arlington City, Texas | 0.0087 | 0.0198 |
| Fort Worth City, Texas | -0.5654 | 0.1436 |
| Austin City, Texas | -0.1554 | -0.0102 |
| Wichita Falls City, Texas | -0.6768 | 0.0939 |
| Dallas City, Texas | -0.2862 | 0.1452 |
| San Antonio City, Texas | 0.1865 | -0.0478 |
| Danville City, Virginia | -0.9673 | 0.1576 |
| Hampton City, Virginia | -0.1088 | -0.1039 |
| Newport News City, Virginia | -1.2051 | 0.1269 |
| Norfolk City, Virginia | -0.3531 | 0.0346 |
| Petersburg City, Virginia | 0.6506 | -0.2559 |
| Portsmouth City, Virginia | 0.3063 | -0.0697 |
| Richmond City, Virginia | 0.5490 | -0.0397 |
| Roanoke City, Virginia | -0.8160 | 0.0830 |
| Suffolk City, Virginia | -2.2817 | 0.3873 |
| Virginia Beach City, Virginia | -0.9654 | 0.1028 |
| Tacoma City, Washington | -1.3153 | 0.2927 |
| Seattle City, Washington | 1.3316 | -0.1706 |