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THE AMERICAN DEATH PENALTY DECLINE

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American death sentences have both declined and become concentrated in a small group of counties. In his dissenting opinion in Glossip v. Gross *in 2014, Justice Stephen Breyer highlighted how from 2004 to 2006, "just 29 counties (fewer than 1% of counties in the country) accounted for approximately half of all death sentences imposed nationwide." That decline has become more dramatic. In 2015, fifty-one defendants were sentenced to death in thirty-eight counties. In 2016, thirty-one defendants were sentenced to death in twenty-eight counties. In the mid-1990s, by way of contrast, over 300 people were sentenced to death in as many as two hundred counties per year. While scholars and journalists have increasingly commented on this*

* Justice Thurgood Marshall Distinguished Professor of Law, University of Virginia School of Law. Many thanks to Jeff Fagan, Jay Koehler, Lee Kovarsky, Rob Smith, Carol Steiker, Jordan Steiker, and participants at a workshop at the Frank Batten School of Leadership and Public Policy and at the University of Oxford Centre for Criminology and the Symposium at Northwestern University School of Law for invaluable comments on earlier drafts. We are grateful to Whitney Farmer, Madeleine Gates, Megan Moore, Joanna Rho, Jack Shirley, Allison Thornton, and Daniel Younger for invaluable research assistance. We thank Kay Beehler, John Blume, Nicole Brambila, David Bruck, Jeff Ellis, Terry Farley, Elizabeth Hambourger, Karen Kraft, Michael Radelet, Mary Shellman, Rob Smith, Emily Skinner, Rob Warden, the Arizona Capital Trial Project, California Appellate Project, Illinois Office of the State Appellate Defender, Maryland Office of the Public Defender, Missouri Public Defender, Ohio Public Defender, Oregon Capital Resource Counsel, Virginia Capital Case Clearinghouse, and others for sharing data with us and the Center for Disease Control for sharing mortality data from the National Vital Statistics System pursuant to a data sharing agreement. We thank the *Journal of Criminal Law and Criminology* for hosting its Symposium on the state of the death penalty.

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decline and speculated as to what might be causing it, researchers have not examined it empirically. This Article reports the results of statistical analysis of data hand-collected on all death sentencing, by county, for the entire modern era of capital punishment, from 1990 to 2016. This analysis of death sentencing data seeks to answer the question why a few counties, but not the bulk of the others, still impose death sentences. We examine state and county-level changes in murder rates, population, victim race, demography, and other characteristics that might explain shifting death sentencing patterns. We find that death sentences are strongly associated with urban, densely populous counties. Second, we find that death sentences are strongly associated with counties that have large black populations. Third, we find homicide rates are related to death sentencing in three ways: within and between death sentencing counties; within and between death sentencing counties following a lag to account for the time it can take for a case to proceed to a sentencing; and that counties with more white victims of homicide have more death sentencing. Fourth, we find that death sentencing is associated with inertia or the number of prior death sentences within a county. These results suggest what remains of the American death penalty is fragile and reflects a legacy of racial bias and idiosyncratic local preferences. We conclude by discussing the practical and legal implications of these trends for the much-diminished death penalty and for criminal justice more broadly.

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INTRODUCTION

In the span of fifteen years, American death sentences have become rare and concentrated in a vanishingly small group of counties. In his dissenting opinion in *Glossip v. Gross* in 2014, Justice Stephen Breyer suggested that the death penalty may now be categorically unconstitutional, noting "dramatic declines" in death sentences even in states like Texas and Virginia.[1] Even within such states, Justice Breyer noted that "[g]eography also plays an important role in determining who is sentenced to death" and that "[b]etween 2004 and 2009, for example, just twenty-nine counties (fewer than 1% of counties in the country) accounted for approximately half of all death sentences imposed nationwide."[2] This Article describes how the decline has become still more dramatic since 2009, based on comprehensive data hand-collected on all death sentencing, by county, for the entire modern era of capital punishment. While scholars and journalists have increasingly commented on this decline and speculated as to what might be causing it,[3] empirical research has not comprehensively examined the question.[4] In this

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[1] 135 S. Ct. 2726, 2775–78 (2015) (Breyer, J. dissenting).

[2] *Id*. at 2761.

[3] *See, e.g.*, DAVID GARLAND, PECULIAR INSTITUTION: AMERICA'S DEATH PENALTY IN AN AGE OF ABOLITION (2010); Richard C. Dieter, *The Future of the Death Penalty in the United States*, 49 U. RICH. L. REV. 921, 925 (2015); Carol S. Steiker & Jordan M. Steiker, *Entrenchment and/or Destabilization? Reflections on (Another) Two Decades of Constitutional Regulation of Capital Punishment*, 30 L. & INEQ. 211, 212, 240–41 (2012); Scott E. Sundby, *The Death Penalty's Future: Charting the Crosscurrents of Declining Death Sentences and the McVeigh Factor*, 84 TEX. L. REV. 1929, 1932–55 (2006); Matt Ford, *The Death Penalty Becomes Rare*, THE ATLANTIC (Apr. 21, 2015); Emily Bazelon, *Where the Death Penalty Still Lives*, N.Y. TIMES (Aug. 23, 2016).

[4] Some important recent empirical research has examined the increased concentration of death sentences in a small subset of counties. A work in progress examines three years of death sentences, each separated by a decade, to empirically evaluate the death penalty decline.

Article, we report results of detailed statistical analysis of these data to answer the question why a few counties, but not the vast bulk of the others, still impose death sentences. Is it murder rates, or population, or demography, or some other characteristic of these counties that explain their death sentencing? We examine characteristics statistically associated with county-level death sentencing, and we conclude by raising important practical and constitutional questions for litigators and judges.

The American criminal justice system is imposing fewer death sentences than at any point in the past three decades. Just fifty-one defendants were sentenced to death in 2015.[5] In 2016, just thirty-one defendants were sentenced to death.[6] In the 1990s, several hundred people were sentenced to death each year.[7] The rapid and stunning drop in death sentences is even more marked at the local level. There are over 3,000 counties in the U.S.[8] Very few counties have imposed death sentences, even

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David McCord & Talia Harmon, *Lethal Rejection: An Empirical Analysis of the Astonishing Decline in Death Sentences in the United States over the Last Two Decades* (manuscript on file with author). An Article examines in detail the decline in Texas death sentences. David McCord, *What's Messing with Texas Death Sentences?*, 43 TEX. TECH L. REV. 601 *passim* (2011). Robert Smith has examined whether trial defense representation may account for altered geography of death sentencing in recent years. Robert J. Smith, *The Geography of the Death Penalty and Its Ramifications*, 92 B.U. L. REV. 227, 265–75 (2012). Lee Kovarsky has examined the increasing concentration of death sentencing in smaller numbers of counties. Lee Kovarsky, *Muscle Memory and the Local Concentration of Capital Punishment,* 66 DUKE L. J. 259 (2016). This Article is part of a research project described in a forthcoming book examining the death penalty decline comprehensively. BRANDON L. GARRETT, END OF ITS ROPE: HOW KILLING THE DEATH PENALTY CAN REVIVE CRIMINAL JUSTICE (2017) [hereinafter GARRETT, END OF ITS ROPE]. Another recent piece examines the Virginia death penalty decline as a case study. Brandon L. Garrett, *The Decline of the Virginia (and American) Death Penalty,* 105 GEO. L. J. 661 (2017) [hereinafter Garrett, *The Decline of the Virginia (and American) Death Penalty*].

5 DEATH ON THE DECLINE, https://public.tableau.com/profile/dustiboy21#!/vizhome/DeathSentencesDashboard/DealthPenaltyCases (last visited June 3, 2017) (presenting these data in visual form and reporting fifty-six death sentences in 2015, five of which were resentencings).

6 *Id*. *See also Defendants Sentenced to Death in 2016*, DEATH PENALTY INFO. CTR., https://deathpenaltyinfo.org/2016-sentencing (last visited Aug. 12, 2017).

7 Portions of this piece are discussed in detail in a forthcoming book examining the decline of the death penalty in America. Garrett, *End of its Rope, supra* note 4. This Article provides the complete description of the underlying empirical research.

8 National Associations of Counties, *County Economies 2015*, at 1 (2016), *available at* http://www.naco.org/sites/default/files/documents/2016%20CET%20repor_KEY%20TERMS_12.21-v2.pdf (stating "[t]here are 3,142 counties and county equivalents in the United States"). When referring to counties, we include incorporated municipalities or cities, parishes, districts, and other types of administrative units. Additionally, a handful of custom jurisdictions were created to ensure longitudinal-consistencies within the analysis. These changes are noted in the Appendix.

in states with the death penalty. Through the 1990s, death-sentencing counties were more widely dispersed, and small rural counties regularly imposed death sentences.[9] Even within the biggest death penalty states, death sentences now come from a shrinking group of individual counties, like Riverside County, California and Duval County, Florida.[10] While the local patterns documented in this paper may be less visible to the public, the forces driving away the death penalty are working fastest at the county level. Today, few counties still sentence individuals to death. The smaller counties simply do not seek the death penalty any longer.

In Part I, we review the literature and describe prominent studies assessing death sentencing patterns. In the 1980s, scholars began to conduct systematic research collecting data on the use of the death penalty at the county level, beginning in individual states with the pioneering work of David Baldus, and ultimately studying groups of states and patterns across all death penalty states.[11] The Baldus study found that death-sentencing rates were highest in rural areas of Georgia but that death-sentencing patterns were quite uniform across the state.[12] The first study to report national death sentencing data comprehensively was the landmark "Broken System" study led by Professors James Liebman, Valerie West, and Jeffrey Fagan, which examined death sentences from 1973 through the early 1990s.[13] Follow-up research found a concentration of death sentences in a small minority of counties.[14] The authors noted: "Even in Texas, nearly 60% of its counties did not impose a single death sentence in the period."[15] That research has been updated, in part. A study by Professor Robert J. Smith of death sentences between 2004 and 2009 found: "The geographic distribution of

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9 *See infra* Part II.A.

10 *Id.*

11 DAVID C. BALDUS ET AL., EQUAL JUSTICE AND THE DEATH PENALTY: A LEGAL AND EMPIRICAL ANALYSIS 268 n.31 (1990). *See generally* Catherine Grosso et al., *Race Discrimination and the Death Penalty: An Empirical and Legal Overview*, *in* AMERICA'S EXPERIMENT WITH CAPITAL PUNISHMENT 525 (J. R. Acker, R. M. Bohm & C. S. Lanier eds., 3d ed. 2014) (providing an overview of subsequent research); U.S. GEN. ACCT. OFF., *Death Penalty Sentencing: Research Indicates Pattern of Racial Disparities* (GAO/GGO-90-57) (1990) (summarizing studies of state-level death sentencing through 1989).

12 BALDUS ET AL., *supra* note 11 at 124–28.

13 JAMES S. LIEBMAN ET AL., A BROKEN SYSTEM: ERROR RATES IN CAPITAL CASES, 1973–1995 (2000).

14 James Liebman & P. Clarke, *Minority Practice, Majority's Burden: The Death Penalty Today*, 9 OHIO ST. J. CRIM. L. 255, 312 (2012).

15 *Id.* at 264. Further, data analysis of appellate and post-conviction reversals showed that state courts were more likely to overturn death sentences from urban than rural and small-town jurisdictions. Andrew Gelman et al., *A Broken System: The Persistent Pattern of Reversals of Death Sentences in the United States*, 1 J. EMPIRICAL LEGAL STUD. 209, 247 (2004).

death sentences reveals a clustering around a narrow band of counties: roughly 1% of counties in the United States returned death sentences at a rate of one or more sentences per year from 2004 to 2009."[16] Today, as we will describe, even leading death-sentencing counties have experienced dramatic declines in death sentences.

The decline in executions is still more pronounced than the decline in death sentences. Of the over 8,000 death sentences handed down from 1977 through 2015, just over 1,400 persons have been executed.[17] A Death Penalty Information Center report analyzing executions since 1976, including data collected by Professor Frank Baumgartner, found that 2% of counties in the U.S. were responsible for a majority of the executions, and 85% of the counties in the U.S. had not had an execution in over 45 years.[18]

In the second and third sections of Part I, we explain our research design and how we analyze hand-collected data on death sentencing in the United States for the time period from 1991-2016.[19] We first explain how that data on death sentencing was collected. We then explain how we obtained and how we analyzed homicide data, data on race and racial fragmentation in counties, population density data, and income data. Finally, we explain the empirical strategy, including the statistical models employed to analyze death-sentencing data.

In Part II, we present the results. In this Article, we analyze county-level death sentencing during the modern era to try to answer why some counties sentence individuals to death where others do not. First, we describe a change in the composition of death sentencing counties from the 1990s, at the height of the modern era of death sentencing in the United States, through the past decade. Far fewer rural and less-populated counties continue to impose death sentences. Instead, population density is strongly associated with death sentencing.[20] However, those large counties have also

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16 Smith, *supra* note 4, at 228.

17 Frank R. Baumgartner, *The North Carolina Database of U.S. Executions*, *U.N.C. Chapel Hill, Department of Pol. Sci.*, http://www.unc.edu/~fbaum/Innocence/executions.htm (last visited June 3, 2017); *see also* Tracy L. Snell, *Capital Punishment, 2013 – Statistical Tables*, *Bureau of Justice Statistics*, 2 (Dec. 19, 2014), http://www.bjs.gov/content/pub/pdf/cp13st.pdf.

18 Baumgartner, *supra* note 17. *See also* Richard C. Dieter, *The 2% Death Penalty: How a Minority of Counties Produce Most Death Cases at Enormous Costs to All*, DEATH PENALTY INFO. CTR., at 1–2 (2013), http://www.deathpenaltyinfo.org/documents/TwoPercentReport.pdf.

19 The phrase refers to the title for Frank Zimring's important book examining the decline in crime in America. FRANKLIN E. ZIMRING, THE GREAT AMERICAN CRIME DECLINE (2006).

20 *See infra* Part II.B.

experienced the sharpest declines in death sentencing.[21]

Second, we find that counties with large black populations engage in more death sentencing.[22] Many studies have found that death sentences are disproportionately imposed in cases in which the victim is white.[23] We found that an increase in black homicide rates is not associated with an increase in county-level death sentencing, while cases with white homicide victims are. Those two factors, presence of large black population centers and white homicide victimization, have been associated with death sentencing in prior studies and with a troubling use of the death penalty to respond to a perceived, although not accurate, racialized sense of threat.[24]

Third, we find that homicide rates are connected with death sentencing in the basic models, as well as when we lag homicides by several years, to account for the time from the crime to a trial and a sentence.[25]

This relates to a fourth finding, that the entrenched practices or "muscle memory" of a county matters a great deal in death sentencing. We found that across a range of measures, inertia in county death sentencing practices, or prior death sentences, is strongly associated with death sentencing. Having imposed a death sentence, a county is far more likely to impose more. This could be due to preferences and practices in prosecutors' offices, and perhaps also the attitudes of local judges and the (in)ability of local defense lawyers. We develop how the growing geographic concentration of death sentences arises from path dependent practices, chiefly in large, densely populated counties with large minority populations.

In Part III, we explore implications for the regulation and the constitutionality of the death penalty. One question is whether the Eighth Amendment forbids excessive geographical arbitrariness in death sentencing. These findings also shed light on the forces that are driving the decline in American death sentencing. Since the move has been from rural to urban and comparatively wealthy counties, cost of capital litigation may play a factor in the decline. The role that race plays in the splintered geography of the death penalty suggests constitutionally troubling explanations for why some counties persist in practices that others do not. The role of homicide rates

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21 *Id*.

22 *Id*.

23 *See infra* Part I.A.

24 This is consistent with the results described in Liebman & Clark, *supra* note 14, at 271

"We thus hypothesize that the relatively greater share of the risk of crime falling on whites in high death-sentencing communities, together with the misperceived threat from large nearby populations of poor African-Americans, gives influential members of these communities a partly accurate, partly inflated, sense of threat from crime emanating from outside."

25 *See infra* Part II.B-C.

suggests that the numbers of murders also matter, particularly when the murder victims are white. Relatedly, the role that inertia plays also suggests that personal and institutional preferences at the county level may matter far more than non-arbitrary factors, such as murder rates. We conclude by asking what salience these findings will have for capital litigants and for Eighth Amendment arguments in the court.

I. THE EMPIRICAL STUDY OF DEATH SENTENCING

A. PRIOR RESEARCH ON DEATH SENTENCING IN THE UNITED STATES

There is a substantial body of empirical work studying death sentencing, and in general, it has documented substantial racial and geographic disparities in death sentencing. The classic studies of death sentencing in Georgia from 1973 through 1979, led by Professor David C. Baldus, made landmark findings regarding the role that race discrimination played in outcomes in homicide cases.[26] That study also analyzed county-level patterns, and it found that death-sentencing rates were highest in rural areas of the state.[27] Adjusting for case characteristics, however, they found "no statistically significant geographic effects," suggesting a "fairly uniform consensus" in the 1970s among Georgia prosecutors concerning which defendants most deserved a death sentence.[28]

If Georgia was representative of death sentencing patterns in the 1970s, however, those patterns may have since shifted. Professor Sherod Thaxton has conducted a series of studies of death sentencing in Georgia from 1993 to 2000, examining all potentially capital cases during that time period. Thaxton describes "low reliability" in consistency of charging cases as capital within jurisdictions, but far larger variation between jurisdictions.[29] Moreover, during this time period, about two-thirds of all homicides were eligible for the death penalty in Georgia.[30] Of those, white-victim cases were 2.4 times more likely to receive a death notice in which prosecutors seek the death penalty, all else being equal.[31] During that time period in Georgia, an

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26 BALDUS ET AL., *supra* note 11, at 268 n.31.

27 *Id*. at 121. Death-sentencing rates had been lower in rural counties than in urban counties prior to the Supreme Court's ruling in *Furman v. Georgia*, 408 U.S. 238 (1972), in 1972, but following that ruling, urban death-sentencing remained constant and rural death-sentencing increased sharply. *Id*.

28 *Id*. at 124–26.

29 Sherod Thaxton, *Un-Gregg-Ulated: Capital Charging and the Missing Mandate of* Gregg v. Georgia*,* 11 DUKE J. CONST. L. & PUB. POL'Y 145, 172–76 (2016).

30 Sherod Thaxton, *Race, Place, and Capital Charging in Georgia*, 67 MERCER L. REV. 529, 533 (2016).

31 *Id*. at 540. *See also* Sherod Thaxton, *Disciplining Death: Assessing and Ameliorating*

analysis based in part on the same data, examining death sentences in Georgia from 1995 to 2004, found that death sentences were imposed 2.38 times more often in non-urban areas, adjusting for a range of case characteristics.[32]

The largest and most complete study of county-level death sentencing that has been conducted, the landmark Broken System study led by Professors James Liebman, Valerie West, and Jeff Fagan, examined death sentences from 1973 through the early 1990s.[33] They found no significant variation in death sentences per murder across counties.[34] Second, in focusing on reversal rates, they found no significant correlation with such reversal rates.[35] Non-significant findings in a second phase of that research were highly suggestive, however—including a finding of higher reversal rates in counties with large minority communities.[36] An update to the Broken System study, by Professor James Liebman and Peter Clarke, examined the 2004–2009 data collected and separately analyzed by Professor Robert Smith.[37] They observed that "death sentencing is retreating to its bastions," finding an increasing concentration of death sentences in a small minority of counties.[38] Moreover certain "high frequency death sentencing communities" were not only increasing their share of death sentencing, but "picking up speed," during that time period.[39] In addition, death sentencing was correlated with county black population as well as white homicide victimization.[40] A motivation of this study was to assess what might explain death sentencing patterns during the subsequent time period in which death sentences began to sharply decline.

A draft Note has described state-level death sentencing patterns during the time period from 1991 through 2015.[41] Ankur Desai examined four

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Arbitrariness in Capital Charging, 49 ARIZ. ST. L. J. __ (forthcoming 2017).

32 Ray Paternoster, *The Death Penalty in Georgia, 1995–2005* (draft on file with author).

33 Gelman, et al., *supra* note 15, at 252–54.

34 *Id*. at 253 ("Our analyses of data at the county level revealed little beyond our state-level regressions.").

35 *Id*.

36 James S. Liebman, et al., *A Broken System Part II: Why There is So Much Error in Capital Cases, and What Can Be Done About It*, Sec. V, 246–54, 257 (Feb. 11, 2002), available at http://www2.law.columbia.edu/brokensystem2/index2.html (describing how "[c]ounties in states where the homicide risk to whites approaches or surpasses that to blacks have higher capital error rates than counties in states where the homicide risk to whites is much lower than to blacks").

37 Liebman & Clarke, *supra* note 14, at 265 n.40; Smith, *supra* note 4, at 265–75.

38 Liebman & Clarke, *supra* note 14, at 331.

39 *Id*. at 332–33.

40 *Id*. at 270–71.

41 *See generally* Ankur Desai, *The Machine Stops: How Professional Capital Defenders Are Ending Use of the Death Penalty in America* (draft on file with authors).

factors in death penalty states and asked whether each was associated with a decline in death sentences: (1) homicide rates; (2) life without parole sentencing availability; (3) the ability of a judge and not a jury to impose a death sentence; and (4) the presence of state level capital defense at trial.[42] Desai found that murder rates were a significant factor in the state-level decline in death sentencing, but its role varied widely from state to state.[43] For example, Texas experienced a sharp drop in capital sentencing as the number of murders fell.[44] However, murders fell even faster in California, and death sentencing remained high.[45] Desai found four conclusions consistent over a range of statistical models.[46] First, the provision of state-level capital defense is strongly and robustly correlated with reduction in sentencing.[47] Second, murder rates were significantly but unreliably correlated with reduction in sentencing.[48] Third, the enactment of life without parole statutes had a small, yet statistically-significant association with reduced death sentencing.[49] Finally, state compliance with *Ring v. Arizona*, the Supreme Court decision that required jury death sentencing,[50] showed erratic coefficients, suggesting any impact was not sound.[51] In this study, without focusing on the effect of those state-level legal interventions, we sought to explore whether these findings extended to the county level.[52]

An important article by Professor Theodore Eisenberg examined county-level death sentencing in five states, Georgia, Maryland, Pennsylvania, South Carolina, and Virginia, along with data on murders from the FBI Supplemental Homicide Reports ("SHR"), and U.S. Census Bureau data on population, income, and urbanization in counties.[53] That study, roughly focusing on the years from 1982 through 1999, found a highly statistically significant, inverse relationship between the number of death row

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[42] *Id*.

[43] *Id*.

[44] *Id*.

[45] *Id*.

[46] *Id*.

[47] *Id.* For additional exploration of these findings, see GARRETT, END OF ITS ROPE, *supra* note 4, at 49–105.

[48] Desai, *supra* note 41, at 1–3.

[49] *Id*. at 1.

[50] 536 U.S. 584 (2002).

[51] Desai, *supra* note 41, at 1–3.

[52] In this Article, we do not explore whether county-level capital trial defense plays a role in death sentencing, as we were not able to reliably construct a dataset during this entire time period regarding county, and not just state-level, capital trial defender offices.

[53] Theodore Eisenberg, *Death Sentence Rates And County Demographics: An Empirical Study*, 90 CORNELL L. REV. 347, 350–51 (2004–2005).

inmates from a county and the number of murders in the county.[54] However, higher murder rates were consistently associated with lower death sentence rates, a finding that is inconsistent with our findings here.[55] One explanation may have been that any given county may have a "limited capacity to process capital cases," Professor Eisenberg suggested.[56] Moreover, almost half of the counties in these states imposed no death sentences at all during the time period.[57] Professor Eisenberg found that higher income counties "tend not to send offenders to death row," a finding also at odds with what we will observe here.[58] Counties with higher black homicide rates had fewer death sentences.[59] The author suggested that this might occur because either: (1) prosecutors are less likely to seek the death penalty in cases with black victims, which is consistent with our findings; or (2) such counties have a greater black population and more black persons in the jury pool, who would be more likely to oppose the death penalty.[60] More urbanized counties, in contrast, had higher death sentencing rates.[61] Again, the Eisenberg study focused on the time period just before the modern death penalty decline began.[62]

Many other studies have examined the role that race plays, particularly the race of the victims, in relation to county prosecutor decisionmaking. A study by Professors Samuel R. Gross and Robert Mauro of death sentencing in eight states from 1976 through 1980 found that most homicides were urban, but that in some states, like Georgia and Florida, rural homicides were more likely to result in death sentences (and that in all locations, white-victim murders were more likely to result in death sentences).[63] Still additional studies have focused on individual states and county-level patterns within those states. For example, a study of New Jersey death sentences from 1982 to 1986 found that a range of factors, substantially differing across counties, affected the chance that a defendant would face a capital trial, but that one consistently important factor was the race of the victim.[64]

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54 *Id*. at 354–55, 358.

55 *Id*. at 358.

56 *Id*.

57 *Id*.

58 *Id*. at 359.

59 *Id*.

60 *Id*. at 360–65, 368. *See also* John Blume et al., *Explaining Death Row's Population and Racial Composition,* 1 J. EMPIRICAL LEGAL STUD. 165, 202–03 (2004).

61 Eisenberg, *supra* note 53, at 356.

62 *Id*. at 350.

63 Samuel R. Gross & Robert Mauro, *Patterns of Death: An Analysis of Racial Disparities in Capital Sentencing and Homicide Victimization*, 37 STAN. L. REV. 27, 64–66 (1984).

64 Leigh B. Bienen, et al., *The Reimposition of Capital Punishment in New Jersey: the*

Studies have examined death sentencing in California, which has the largest death row in the country.[65] A study by Professors Glenn L. Pierce and Michael L. Radelet, looking at the time period from 1990 to 1999, found higher death sentencing rates in counties with more non-Latino Whites.[66] They noted that California led the nation in homicides, and that the rate for victimization of blacks was high (but not unusual compared to national statistics.)[67] They found—consistent with Eisenberg's study—that death-sentencing rates were lowest for counties with denser populations.[68] Controlling for a range of variables, and focusing on 262 death sentences in California, they found that: "The whiter the county, the higher its death sentencing rate will be."[69] They note, however that "[t]o accurately assess the full range of factors that may or may not affect criminal justice decisions, all links and actors in the decision-making process must be monitored."[70] A 2007 study by the ACLU of Northern California examined the counties that sentenced the most people to death in that state from 2000–2007.[71] Ten counties accounted for 83% of the death sentences in the state during that time period.[72] The study found real variability in murder rates among the counties that sentence the most people to death.[73] The study observed correlation between death sentencing and demographics, homicide solve

Role of Prosecutorial Discretion, 41 RUTGERS L. REV. 27, 66 (1988).

[65] *Death Row Inmates by State*, DEATH PENALTY INFO. CTR., http://www.deathpenaltyinfo.org/death-row-inmates-state-and-size-death-row-year; ACLU of Northern California, *California's Death Penalty is Dead: Anatomy of a Failure* (July 2011), at http://www.aclunc.org/docs/criminal_justice/death_penalty/the_death_penalty_is_dead_2011.pdf; Steven F. Shatz, *The Eighth Amendment, the Death Penalty, and Ordinary Robbery-Burglary Murderers: A California Case Study*, 59 FLA. L. REV. 719, 745–46 (2007); Steven F. Shatz & Nina Rivkind, *The California Death Penalty Scheme: Requiem for* Furman, 72 N.Y.U. L. REV. 1283, 1333 (1997). For a description of a study led by David Baldus and introduced in litigation in California, see Justin Marceau et al., *Death Eligibility in Colorado: Many Are Called, Few Are Chosen*, 84 U. COLO. L. REV. 1069, 1071 n.2 (2013) (studying Colorado homicides from 1999 to 2010 and finding 90% death-eligible).

[66] Glenn L. Pierce & Michael L. Radelet, *Empirical Analysis: The Impact of Legally Inappropriate Factors on Death Sentencing For California Homicides, 1990–1999*, 46 SANTA CLARA L. REV. 1 (2000).

[67] *Id*. at 5–6.

[68] *Id*. at 29–30.

[69] *Id*. at 36.

[70] *Id*. at 37.

[71] Romy Ganschow, *Death by Geography: A County by County Analysis of the Road to Execution in California, ACLU of Northern California*, at https://www.aclunc.org/sites/default/files/death_by_geography_0.pdf (last visited Sept. 13, 2017).

[72] *Id.* at 3.

[73] *Id.*

rates, or voting patterns.[74] That study also noted the increasing concentration of death sentencing since 2000—from 1977 to 1999, ten counties accounted for over 70% of death sentencing, but from 2000 to 2007, they accounted for 83% of death sentencing.[75] A Note examined two California counties with similar homicide clearance rates, but very different prosecution budgets, and found a correlation between death sentencing and prosecution budgets.[76]

A series of studies have examined the role of prosecutorial discretion in seeking the death penalty. They have found that prosecutors' practices matter. They vary as between urban and rural counties, but they also vary based on more idiosyncratic local preferences. For example, a study of homicides in South Carolina from 1993 to 1997 by Professors Michael J. Songer and Isaac Unah examined geography and found that prosecutors were more likely to seek the death penalty in rural counties. [77] The study failed to find any correlation between homicides and the probability of a death penalty prosecution—including when the authors controlled for whether murders in counties were aggravated murders accompanied by other felonies like rape, robbery, or arson.[78] The authors concluded: "The results of this regression analysis highlight the arbitrariness inherent in South Carolina's capital punishment system by suggesting the importance of the individual proclivities of the local prosecutors who decide whether to seek the death penalty."[79] A study of death sentencing in Nebraska from 1973 to 1999, by Professors David C. Baldus, George Woodworth, Catherine Grosso, and Aaron M. Christ, found decreasing death sentencing rates in urban areas, consistent with other state studies discussed.[80] A Maryland study similarly

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[74] The ACLU study summarized:

> "Counties that are aggressive in death sentencing are in both the northern and southern parts of the state, inland and coastal regions. They represent counties that have liberal and conservative views on criminal justice. The counties are both densely and sparsely populated. They have both high and low homicide rates, and high and low rates of solving homicides. Counties that sentence people to execution less frequently exhibit all of these same characteristics."

Id.

[75] *Id.*

[76] Ashley Rupp, Note, *Death Penalty Prosecutorial Charging Decisions and County Budgetary Restrictions: Is the Death Penalty Arbitrarily Applied Based on County Funding?*, 71 FORDHAM L. REV. 2735, 2766–67 (2003).

[77] Michael J. Songer & Isaac Unah, *The Effect of Race, Gender, and Location on Prosecutorial Decisions to Seek the Death Penalty in South Carolina*, 58 S.C. L. REV. 161, 205 (2006).

[78] *Id*. at 198.

[79] *Id*. at 203.

[80] David C. Baldus et al., *Arbitrariness and Discrimination in the Administration of the Death Penalty: A Legal and Empirical Analysis of the Nebraska Experience (1973–1999)*, 81 NEB. L. REV. 486, 668 (2002).

found geographic disparities, including those based on prosecutorial discretion; for example, the chances of being sentenced to death in Baltimore County were thirteen times higher than in Baltimore City, when Maryland had the death penalty.[81] A Virginia study similarly found major geographic differences in charging practices by prosecutors.[82] A comprehensive study of the Connecticut death penalty, before the state abolished it, by Professor John J. Donohue, found both substantial race of victim disparities in death sentencing and geographic disparities.[83] A New Jersey study similarly focused on the role of prosecutorial discretion in death sentencing.[84]

Studies have also focused on single counties, such as two studies of death charging and sentencing in San Francisco County.[85] Another study of Alameda County, California found racial disparities within the county in death sentencing.[86] A Texas study examined four large urban counties from 1980 to 1996 and found disparities due to case seriousness, but also due to the race of the victim.[87] A Missouri study found major differences in first-degree murder sentencing based on the racial make-up of jury pools.[88] An Ohio study found large county disparities, as well.[89] An Alabama study found

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[81] RAYMOND PATERNOSTER ET AL., AN EMPIRICAL ANALYSIS OF MARYLAND'S DEATH SENTENCING SYSTEM WITH RESPECT TO THE INFLUENCE OF RACE AND LEGAL JURISDICTION 30–31 (2003).

[82] Tony G. Poveda, *Geographic Location, Death Sentences and Executions in Post-Furman Virginia*, 8 PUNISHMENT & SOC'Y 423, 424 (2006).

[83] John J. Donohue, *An Empirical Evaluation of the Connecticut Death Penalty System Since 1973, Are There Unlawful Racial, Gender, and Geographic Disparities?*, 11 J. OF EMPIRICAL LEGAL STUD. 637, 637 (2014) (finding, for example, that "[c]onsidering the most common type of death-eligible murder – a multiple victim homicide – a white on white murder of average egregiousness outside [the city of] Waterbury has a 0.57 percent chance of being sentenced to death, while a minority committing the identical crime on white victims in Waterbury would face a 91.2 percent likelihood").

[84] Bienen et al., *supra* note 64, at 178–84.

[85] Richard A. Berk et al., *Chance and the Death Penalty*, 27 L. & SOC'Y REV. 89, 100–08 (1993); Robert E. Weiss et al., *Assessing the Capriciousness of Death Penalty Charging*, 30 L. & SOC'Y REV. 607, 607–08 (1996).

[86] Steven F. Shatz & Terry Dalton, *Challenging the Death Penalty with Statistics: Furman, McCleskey, and a Single County Case Study*, 34 CARDOZO L. REV. 1227, 1227–28 (2013).

[87] Deon Brock et al., *Arbitrariness in the Imposition of Death Sentences in Texas: An Analysis of Four Counties by Offense Seriousness, Race of Victim, and Race of Offender*, 28 AM. J. OF CRIM L. 43, 68–69 (2000).

[88] Katherine Barnes et al., *Place Matters (Most): An Empirical Study of Prosecutorial Decision-Making in Death-Eligible Cases*, 51 ARIZ. L. REV. 305, 306–07, 329–330 (2009).

[89] Alice Lynd, *Unfair And Can't Be Fixed: The Machinery of Death In Ohio*, 44 U. TOL. L. REV. 1, 36 (2012) (reporting results of ABA study finding "(1) those who kill Whites are 3.8 times more likely to receive a death sentence than those who kill Blacks and (2) the chances of a death sentence in Hamilton County are 2.7 times higher than in the rest of the state, 3.7

a correlation between homicides and death sentences, and it did not find an effect of racial composition of a county, but rather racial segregation.[90]

These studies, taken together, suggest that at least by the 1980s and 1990s, there emerged great disparities between county-level charging patterns in death penalty states. The studies also focus on the role played by prosecutorial discretion.[91] The studies tended to find that urban areas have lower death-sentencing rates, given their larger populations.[92] The results regarding homicide rates are uneven across these studies; the studies did not consistently find a relationship between homicide rates and death sentences.[93] Somewhat more consistently, these studies have often found that race can play a role, including due to the race of the victim, but perhaps also with different effects due to race segregation in a county or perhaps the presence of more minority jurors in a county.[94] We sought to examine many of those patterns during the more recent time period from 1990 to 2015.

B. DATA SOURCES

1. Death Sentencing Data

The primary dependent variable in the analysis is the number of death sentences in a given year in a given county. There was no single authoritative national list of cases in which persons have been sentenced to death in the U.S.—such a list was the necessary starting place for this statistical analysis. The Bureau of Justice Statistics ("BJS") maintains data on the numbers of individuals sentenced to death each year in the U.S., as reflected in Figure 1.[95] However, BJS does not share data with identifiers, permitting one to identify those persons, what counties they were sentenced in, or other case-specific information.[96] Professor Robert Smith, who has led research

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times higher than in Cuyahoga County, and 6.2 times higher than in Franklin County").

[90] Jennifer Adger & Christopher Weiss, *Why Place Matters: Exploring County-Level Variations In Death Sentencing In Alabama*, 2011 MICH. ST. L. REV. 659, 660 (2011).

[91] *See, e.g.*, Songer & Unah, *supra* note 77.

[92] Gross & Mauro, *supra* note 63, at 64–66. *But see* Eisenberg, *supra* note 53, at 356.

[93] *Compare* Gross & Mauro, *supra* note 63, *with* Eisenberg, *supra* note 53, at 354–55.

[94] *See* Donohue, *supra* note 83; *see generally* Grosso et al., *supra* note 11; *see also* Stephanie Hindson et al., *Race, Gender, Region and Death Sentencing in Colorado, 1980–1999*, 77 U. COLO. L. REV. 549, 581 (2006) ("The data show that prosecutorial decisions to seek death sentences in Colorado . . . are strongly correlated with race, ethnicity, and gender of the homicide victim.").

[95] *See infra* Figure 1.

[96] In addition, the BJS data is altered from year to year, as BJS learns of additional information and revises its data. "Prisoners Sentenced to Death and the Outcome of the Sentence, by Year of Sentencing, 1973–2012," No. 16, 19, in *Capital Punishment, 2012 Statistical Tables*, U.S. Department of Justice (2014) (revising earlier data to state that 315

studying the modern geography of the death penalty, assembled a dataset, which he generously shared with us, for death sentences from 2004 through 2015. Professor Smith's analysis of that data, from 2004 to 2009, uncovered how fewer than 10% of the counties in the country sentenced anyone to death during that time period, and about 1% of counties (twenty-nine counties) accounted for about 44% of all death sentences.[97] Professor Smith noted: "In 2009, Los Angeles County, California sentenced the same number of people to death as the State of Texas. Maricopa County, Arizona sentenced more people to death than the State of Alabama."[98]

We wanted to examine whether that concentration of death sentencing at the county level has continued in more recent years, and looking farther back, we wanted to explore when this pattern began and what factors may be statistically associated with these county-level patterns. Our initial project was to collect nationwide death sentencing data from 1991 to 2016. We include resentences, or death sentences imposed after an earlier death sentence for a person was overturned on appeal or post-conviction, because those instances represent a new sentencing trial and a new occasion at which the factfinder chose to impose a death sentence. For that reason, the numbers of death sentences reported in each year are somewhat higher than those reported by the BJS and the Death Penalty Information Center ("DPIC"), which limit their reporting to new death sentences.[99]

We initially drew upon lists of names of persons sentenced to death contained in the NAACP Legal Defense Fund's quarterly Death Row USA reports.[100] Those names are themselves obtained from state corrections records. We independently compared current department of corrections records with those reports.[101] We ran news and Westlaw searches in each

persons were sentenced to death in 1994, as compared with 311 in the earlier report). *See* discussion in McCord & Harmon, *supra* note 4.

[97] Smith, *supra* note 4, at 233.

[98] *Id.*

[99] *See Death Sentences in the United States from 1977 By State and By Year*, DEATH PENALTY INFO. CTR., http://www.deathpenaltyinfo.org/death-sentences-united-states-1977-present (last visited Sept. 13, 2017) (describing BJS data and data supplemented by DPIC from 2013 to 2016).

[100] *Death Row USA*, NAACP LEGAL DEF. & EDUC. FUND, INC., http://www.naacpldf.org/death-row-usa.

[101] For example, the Texas Department of Criminal Justice lists detailed information concerning both current and former death row residents. *See Executed Offenders*, TEX. DEP'T OF CRIM. JUST. (July 28, 2017), https://www.tdcj.state.tx.us/death_row/dr_executed_offenders.html; *Offenders on Death Row*, TEX. DEP'T OF CRIM. JUST. (July 21, 2017), https://www.tdcj.state.tx.us/death_row/dr_offenders_on_dr.html; *Offenders No Longer on Death Row*, TEX. DEP'T OF CRIM. JUST. (June 21, 2017), https://www.tdcj.state.tx.us/death_row/dr_offenders_no_longer_on_dr.html.

state to cross-check those lists of names. In addition, we obtained lists of death sentences from capital defense and appeals organizations in almost every death penalty state, and cross-checked each of those lists.[102] Finally, we contacted scholars that have conducted studies of death sentencing in several states, and compared the data they generously shared with each of these lists.[103] The result is a detailed database of persons sentenced to death from 1991 to 2016, which we are making available online as a research resource.[104] For data on death sentences before 1991, we have relied upon data from the Broken System study led by Professors James Liebman, Valerie West, and Jeff Fagan, which examined death sentences from 1973 through the early 1990s.[105] This analysis includes 1990 data from that study.

2. Homicide Data

Death sentences are initially modeled as a function of four primary independent variables. Homicide rates proxy the prevalence of sentencing-eligible offenses within a given county. The two most commonly used sources for homicide data—the Center for Disease Control (CDC) mortality data from the National Vital Statistics System[106] and the FBI Supplemental Homicide Reports ("SHR")[107]—pose various tradeoffs. Mortality data in the CDC are derived primarily from coroners or medical examiner records, while the SHR uses reports and other data filed with local police precincts.[108] The CDC data is therefore more inclusive; there are many deaths that are never

[102] Among those who shared data, we thank: the Arizona Capital Trial Project, the California Appellate Project, the Georgia Resource Center, the Ohio Public Defender, the Illinois Office of the State Appellate Defender, the Maryland Office of the Public Defender, the Missouri Public Defender, North Carolina Center for Death Penalty Litigation, the Virginia Capital Case Clearinghouse and still additional individuals thanked in footnote *.

[103] Michael Radelet generously shared 1990s data collected concerning Florida death sentences. John Blume generously shared South Carolina data. David McCord and Talia Harmon shared their national 1994, 2004, and 2014 data. As noted, Robert Smith shared data collected from 2004–2015. Rob Warden shared Illinois data. Nicole Brambila and the *Reading Eagle* shared Pennsylvania data.

[104] The website is currently under construction.

[105] Gelman et al., *supra* note 13, at 252–54. Because that study included only death sentences for which appeals were finalized at the time the research was conducted, we collected data going back to 1991.

[106] Center for Disease Control and Prevention, *Mortality Data from the National Vital Statistics System*, MMWR (Mar. 3, 1989), http://www.cdc.gov/mmwr/preview/mmwrhtml/00001356.htm.

[107] *See, e.g.*, *Uniform Crime Reporting Program, Supplemental Homicide Reports Data: 2014*, NATIONAL ARCHIVE OF CRIMINAL JUSTICE DATA, http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/36393 (last visited Sept. 13, 2017).

[108] *U.S. Dep't. of Justice, Bureau of Justice Statistics*, *The Nation's Two Measures of Homicide* 1–2 (July 2014), https://www.bjs.gov/content/pub/pdf/ntmh.pdf.

reported to local law enforcement but are still processed by local healthcare authorities as required by state laws in order to produce a death certificate.[109] However, critics contend that the CDC data is *over-inclusive*.[110] In the context of death penalty sentencing, the number of homicides documented by police precincts are more relevant since they only focus on cases with known offenders (cases more likely to result in arrests, prosecutions, and then possible death sentences).[111] In terms of data features, the clear advantage lies with the SHR. While both data sources provide basic demographic information about the victims, the SHRs also provide information about the offenders and murder clearance rates.[112] For the sake of robustness, the analysis therefore models homicide rates using estimates derived from both data sources.

One important limitation of focusing on aggregate murder rates is that not all murders are death-eligible.[113] Death eligibility can be an elusive concept. Definitions of death eligibility vary from state to state. In many states, the criteria include quite vague standards that provide prosecutors with substantial discretion in deciding whether to seek the death penalty.[114] Some states have definitions of death-eligibility that are so broad that most murders

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[109] *Id.*

[110] *See, e.g.*, Pierce & Radelet, *supra* note 66, at 29.

[111] *See The Nation's Two Measures of Homicide, supra* note 108*; see also Homicide*, BUREAU OF JUST. STAT., https://www.bjs.gov/index.cfm?ty=tp&tid=311 (last visited Sept. 13, 2017). The CDC also records between 2,500 and 3,000 additional homicides in 2011, due to the September 11, 2001 attacks, which are omitted in FBI data. For an analysis of the shortcomings of the SHR data, see Michael D. Maltz, *Bridging Gaps in Police Crime Data*, BUREAU OF JUST. STAT. 1 (1999), https://www.bjs.gov/content/pub/pdf/bgpcd.pdf.

[112] CDC micro-level data were obtained from the Division of Vital Statistics at the National Center for Health Statistics, a collaborative effort between the federal CDC and the states. Homicides were flagged and aggregated at the county level for each year in the data. Per our data sharing agreement, we cannot make public any individual county-level data for counties with less than ten deaths in a given year. SHR data were adapted from the aggregated dataset produced by Fox and Swatt for 1990–2007. James Alan Fox & Marc. L. Swatt, *The Recent Surge in Homicides Involving Young Black Males and Guns: Time to Reinvest in Prevention and Crime Control* (Dec. 2008), http://www.jfox.neu.edu/Documents/Fox%20Swatt%20Homicide%20Report%20Dec%2029%202008.pdf. Yearly data files from 2008 onward were manually downloaded, cleaned, and aggregated. All SHR data were obtained from the Interuniversity Consortium for Political and Social Research at http://www.icpsr.umich.edu/index.html.

[113] For a discussion of death eligibility doctrine and statutes, see Chelsea Creo Sharon, *The "Most Deserving" of Death: The Narrowing Requirement and the Proliferation of Aggravating Factors in Capital Sentencing Statutes*, 46 HARV. C.R.-C.L. REV. 223 (2011).

[114] *See, e.g.*, Va. Code § 19.2–264.4(C) (2008) ("[C]onduct in committing the offense was outrageously or wantonly vile, horrible or inhuman, in that it involved torture, depravity of mind or aggravated battery to the victim.").

are death eligible.[115] Studies have found wide variation in how many murders are death eligible, ranging from 20% to 90% of all murders.[116] The well-known study led by Professor David Baldus of Georgia death sentences found that 86% of murder convictions were death eligible.[117] Thus, the question whether a homicide is death eligible is not easy to answer, given broad eligibility criteria in many states, and available evidence suggests that varying, but sometimes quite large, percentages of homicides are death eligible. Since it is not always obvious how to define death eligible homicides, despite the limitations described, we have used unadjusted homicide rates in this paper.

3. Race

The analysis also examines the effect of a county's racial composition on sentencing behavior. Data on the proportion of a county's population that is black or African-American are obtained from the U.S. Census Bureau.[118] A racial fragmentation measure also proxies racial demography within each county. This alternative measure reports the probability that two randomly selected individuals belong to different racial groups.[119] The racial fragmentation variable is highly collinear with the black population share variable, so that it is ill-advised to include both measures of racial composition in the same model. For the sake of economizing on space, and following general convention in the literature, the analysis defaults to the black population share measure. The results are substantively similar across both measures.

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[115] Marceau et al., *supra* note 65, at 1109.

[116] *See id.* at 1109; Jeffrey Fagan et al., *Capital Punishment and Capital Murder: Market Share and the Deterrent Effects of the Death Penalty*, 84 TEX. L. REV. 1803, 1824–26 (2006) (finding national death eligibility rate of 25% based on FBI SHR data and slightly lower 21% Texas rate); *see also* Raymond Paternoster et al., *Justice by Geography and Race: The Administration of the Death Penalty in Maryland, 1978–1999*, 4 U. MD. L.J. ON RACE, RELIGION, GENDER, & CLASS 1, 8–9 (2004) (finding 21% death eligibility rate in Maryland); Steven F. Shatz & Nina Rivkind, *The California Death Penalty Scheme: Requiem for Furman*, 72 N.Y.U. L. REV. 1283, 1332 (1997) (finding 84% death eligibility rate in California).

[117] BALDUS ET AL., *supra* note 11, at 268 n.31. (finding that 86% of crimes reported to the FBI were death-eligible under Georgia's quite broad sentencing statute, while 65% of convicted defendants were death-eligible). There may be still wider variation in individual judgment whether a given defendant is the "worst of the worst" deserving the death penalty under a given capital sentencing scheme. *See* Donohue, *supra* note 83, at 644–45.

[118] *U.S. Census Bureau Intercensal Estimates*, http://www.census.gov/popest/data/historical.index.html; http://www.census.gov/popest/data/counties/asrh/2014/index.html. (last visited Mar. 3, 2016).

[119] The fragmentation measure is calculated using the three main racial categories reported in the census data: white, black, other.

4. Population Density

The third primary variable is the population density of each county, measured as the number of persons per square mile. The inclusion of some measure of density/urbanization is a common covariate in the literature. Densely populated areas tend to have different patterns of social interaction, political values and priorities, labor market dynamics, etc. than their rural counterparts—all of which can be simultaneously correlated with covariates in the analysis and the dependent variable. Population density is also a suitable proxy for total population, since the two variables are highly correlated.[120] Many studies use urbanization rates, but this analysis uses population density for two principal reasons. First, the definition of urban versus rural has changed over time,[121] which compromises the longitudinal compatibility of the data (particularly since we hope to build upon this study by including data from earlier time periods in the 1970s and 1980s). Second, comprehensive inter-censal estimates of urbanization data at the county-level are not readily available from the U.S. Census Bureau. Urbanization rates would have to be interpolated for inter-censal years in the 1990s and early 2000s using snapshots taken at the 1990, 2000, and 2010 census. Any estimates interpolated from so few data points would be of questionable validity.

5. Income

Income per capita is the final primary independent variable considered in the analysis. The death penalty is an expensive legal and judicial enterprise,[122] so this variable proxies the budgetary wherewithal of local law enforcement and judicial systems. Income per capita also works as a crude 'catch-all' for other important socio-demographic data—such as political attitudes (wealthier individuals tend to vote more conservatively)[123] and education levels (wealthier individuals tend to have more years of formal education)[124]—that could exert influence over the dependent and other

[120] The correlation coefficient between the logs of population density and total population is r = .84. Ceterius paribus, more populous counties will have higher concentrations of people living within a given geographic radius—in this case, persons per square mile.

[121] For more information, see *Urban and Rural*, UNITED STATES CENSUS BUREAU, https://www.census.gov/geo/reference/urban-rural.html (last visited Sept. 13, 2017).

[122] For a collection of state and federal studies regarding the cost of the death penalty, see *Costs of the Death Penalty*, DEATH PENALTY INFO. CTR., http://www.deathpenaltyinfo.org/costs-death-penalty?did=108&scid=7 (last visited Sept. 13, 2017).

[123] *See, e.g.*, David Brady & Clem Brooks, *Income, Economic Voting, and Long-Term Political Change in the U.S., 1952–1996*, 77 SOC. FORCES 1339 (1999).

[124] *See, e.g.*, Thomas Lemieux, *Postsecondary Education and Increasing Wage*

independent variables. This has the advantage of parsimoniously controlling for many potentially relevant factors but the distinct disadvantage of complicating efforts to interpret which mechanisms—or sets of mechanisms—are represented in the regression coefficient on the income variable. We would ideally want separate covariates for education, partisanship, and other factors that would simultaneously be correlated with income and death penalty sentencing, but resource constraints and data availability issues prevented us from gathering the requisite statistics. We will consider these factors more explicitly in subsequent analyses. Income per capita data are calculated from population and income estimates provided by the Bureau of Economic Analysis.[125]

The four main independent variables described here are also supplemented by conjecture-specific covariates in the analyses in the next section. These variables explore the racial context of homicides as well as the role of inertia in sentencing behavior over time. Specifics on the sources, computation, and interpretation of these variables will be provided in context. Before proceeding to the analysis, it is also important to note that many of the independent variables are heavily right-skewed in their distributions.[126] Failure to correct for skewness can prevent model convergence and/or result in making invalid inferences when estimating using linear models.[127] As such, all of the offending variables are log-transformed to help normalize their distributions.[128]

C. EMPIRICAL STRATEGY

Death sentencing is an extremely rare event. Roughly 95% of the sampled county-years report no death sentences. This explains why the mean number of sentences is 0.08 while the standard deviation is 0.48. The negative binomial regression model is frequently used to model over-dispersed, non-negative count outcomes. In this context, over-dispersion means that the observed variance in the distribution of the dependent variable

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Inequality, 96 AM. ECON. REV. 195 (2006).

[125] *Yearly income and population estimates taken from Local Area Personal Income Accounts*, BUREAU OF ECON. ANALYSIS, Table CA30: Economic Profile, https://www.bea.gov/regional/downloadzip.cfm (last visited Apr. 28, 2016).

[126] Income per capita, for instance, has a mean value of $25,800 but a standard deviation of $9,900 and a range that spans $5,100 to $194,500.

[127] JOHN FOX, APPLIED REGRESSION ANALYSIS & GENERALIZED LINEAR MODELS 59 (3d ed. 2016).

[128] The log function is undefined at values <= 0, so many observations (e.g., county-years with a homicide rate of 0) would be dropped from the analysis. To correct for this, arbitrary start values (usually a value of "1") were added to the offending variables to ensure that each variable to be transformed had a strictly positive, non-zero range of values.

is greater than the dependent variable's average value. Alternative models derived from the Poisson distribution assume no over-dispersion and will subsequently under-predict the number of 0 counts in the sample.

An appropriate strategy also needs to model the longitudinal dependence between the number of death sentences in county *i* at time *t* and during all previous time periods (e.g., $t - 1$, $t - 2$, etc.), as well as the hierarchical dependence between observations clustered within the same state *j*. Failure to do so can generate invalid inferences on the basis of incorrect coefficients and biased standard errors. As such, death sentences are modeled using a mixed-effects conditionally-correlated regression model. The number of death sentences in each county-year is modeled as a function of a county-specific random-intercept, a panel of county-level covariates, and fixed-intercepts for state and year to simultaneously control for unobservable characteristics at the state level and trends with respect to time. An alternative specification further isolates the influence of county-level factors by fitting separate intercepts for each state-year in the dataset (i.e., Alabama 1990, Alabama, 1991, Alabama 1992, etc.). This allows the effects of time to vary across the unique domestic environment in each state. The tradeoff is that this latter specification causes the number of additional covariates to be estimated to grow from sixty-three (twenty-six intercepts for time plus thirty-seven intercepts for each state in which the death penalty was legal at some point between 1990 and 2016) to 949 distinct intercepts for each state-year. The estimation of so many additional parameters occasionally caused convergence issues, which are documented accordingly in the results.

The conditionally-correlated regression model also includes time-averaged values of all of county-level covariates in the model. This approach—pioneered by Mundlak (1978) and Chamberlain (1982)—uses the addition of these time-averaged values to control for any observable correlation between the county-effects and the independent variables in the model.[129] This ensures that any remaining unobserved heterogeneity is uncorrelated with the independent variables. An additional advantage of the conditionally-correlated approach is that it relaxes the restriction found in a traditional random effects approach whereby the within- and between-effects of covariates are traditionally presented in the form of a weighted average. This allows the analysis to explore effect heterogeneities in the covariates within the same county over time (i.e., the within-effect) and between counties on average (e.g., the between-effect).

[129] Gary Chamberlain, *Multivariate Regression Models for Panel Data*, 18 J. OF ECONOMETRICS 5 (1982); Yair Mundlak, *On the Pooling of Time Series and Cross Section Data*, 46 ECONOMETRICA 69 (1978).

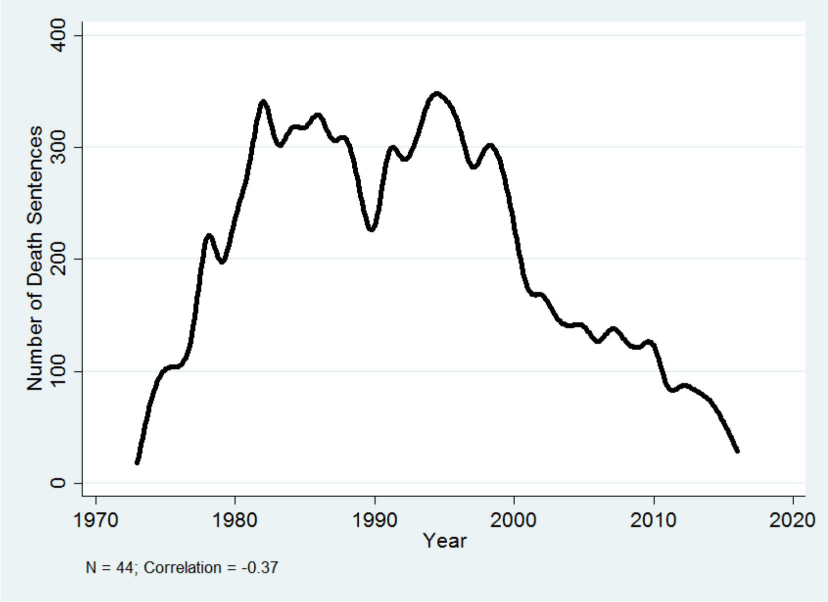
II. FINDINGS: EXPLAINING THE DECLINE IN DEATH SENTENCING

A. DESCRIPTIVE TRENDS

The modern death penalty era begins with the Supreme Court's ruling in *Furman v. Georgia*, holding then-extant death penalty statutes unconstitutional in 1972.[130] In the years after that ruling, death sentences rose sharply, reaching their modern height in the mid-1990s. However, beginning in the late 1990s, death sentences began a steady fall. Death sentences have declined by more than two-thirds since 2000. The figure below shows these data. No one predicted that this decline would happen, much less so deeply and so quickly.

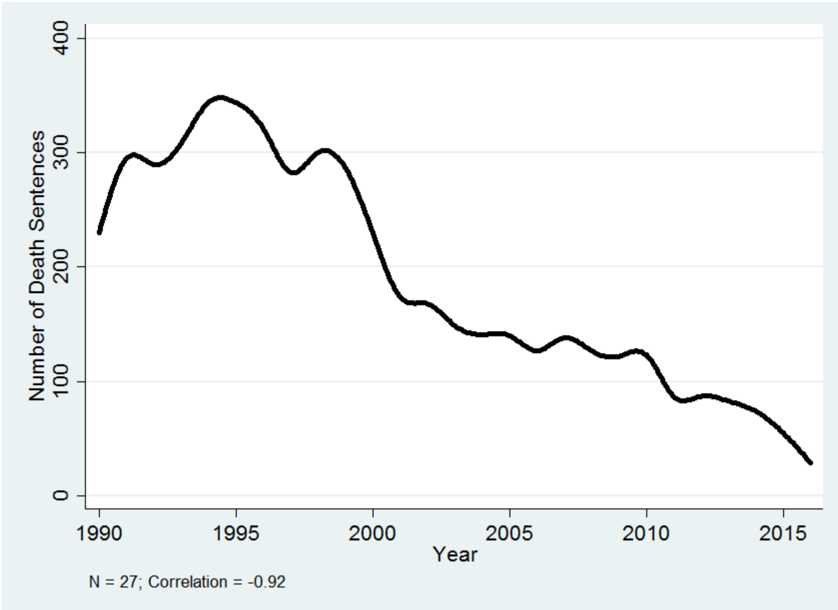
[130] 408 U.S. 238 (1972).

Fig. 1. Death Sentences in the United States, 1973-2016



Where death sentences were regularly handed out in hundreds of counties in the 1990s, including in small rural counties, today, death sentences are concentrated in less than a dozen counties and chiefly in large, densely populated counties. In the five years from 1996–2000, 536 counties imposed death sentences. That dropped to 367 counties from 2001–2005, 304 from 2006–2010, and 203 counties that imposed death sentences from 2011–2015. In 2015, only thirty counties sentenced people to death and only *nine counties* sentenced more than one person to death. In 2016, only twenty-eight counties sentenced people to death and only one county, Los Angeles, California, sentenced more than one person to death. The figure below depicts this rise in the number of counties with death sentences in the mid-1990s and the sharp drop in the numbers of counties imposing death sentences in each year since the mid-1990s.

Fig. 2. Number of Counties with Death Sentences, 1990-2016



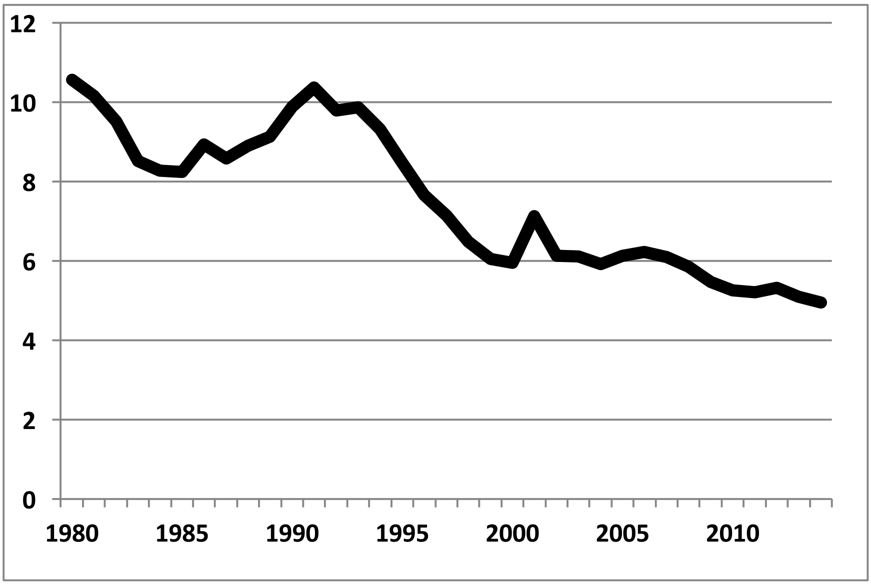
The handful of counties that still impose death sentences today mostly consist of large counties. The average population (based on 2010 Census figures) of the counties imposing death sentences in 2015 was over 1,000,000 people. Only two of the thirty counties that imposed death sentences had fewer than 100,000 people. In Part II, we will explore these data in more detail, examining population density and other demographics, to get a better sense of why it is that so many fewer counties impose death sentences, and what the characteristics of those counties are. The goal is to better understand what is animating this remarkable social trend.

Beginning in the mid-1990s, crime fell across a wide range of demographics and geographic areas and across all types of crimes, from homicides to property crimes.[131] America experienced a decline in homicides in the early 1990s, continuing to the present, with only slight deviations. To be sure, the decline is not perfectly even, and in some years there have been spikes, such as in 2001 due to the September 11, 2001 attacks, in 2006–2007, and most recently, with a spike in homicides in 2015. Over the entire time period, the raw numbers of murders declined dramatically from almost

[131] *See generally* Steven D. Levitt, *Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that Do Not*, 18 J. OF ECON. PERSP. 163 (2004); ZIMRING, *supra* note 19.

25,000 in 1991 to fewer than 13,000 by 2010.[132] The figure below illustrates this trend using data from the CDC.

Fig. 3. The U.S. Homicide Rate Per 100,000 People, 1980-2014

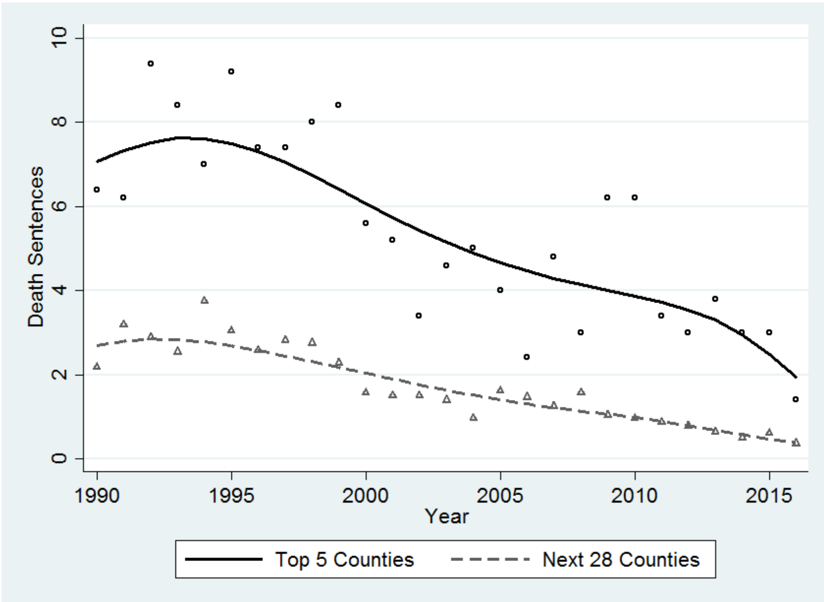


Death sentencing in the modern era in the U.S., from the 1970s through the present, has become increasingly concentrated in a small number of counties. Our goal was to examine what those counties have in common and what factors might be correlated with this increased concentration in death sentencing. While death sentencing has become more concentrated in the group of top-death sentencing counties, it is those counties that have also experienced the steepest drops in death sentencing. For the bulk of death sentencing counties, even a single death sentence is an uncommon event. As Professors James Liebman and Peter Clarke note, one might expect a smooth, even decline in death sentencing in response, perhaps, to declining crime rates, if death sentences were imposed rationally and consistently. However, if death sentencing was always a practice unevenly and arbitrarily practiced, that would not occur. Instead, as they observed in 2010, in a fairly rapid fashion, "death sentencing is retreating to its bastions, as less frequent users

[132] U.S. Dep't of Justice, *Bureau of Justice Statistics, Sourcebook of Criminal Justice Statistics Online*, tbl.6.79.2011, http://www.albany.edu/sourcebook/pdf/t6792011.pdf (last visited Sept. 13, 2017).

abandon the practice altogether."[133] What has changed since the time in which they wrote is that death sentencing even in the "bastions" has declined. We found that the top five counties experienced a sharp drop in death sentencing from the mid 1990s through present. The next twenty-eight counties experienced a more modest drop,[134] as the figure below illustrates.

Fig. 4. Average Death Sentences Per County (1990-2016)

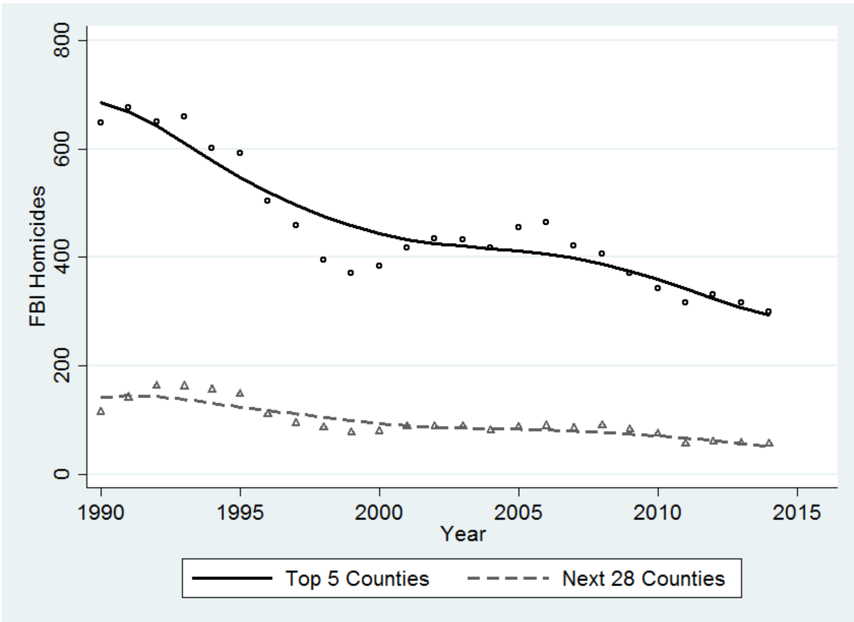


Those sharp drops do not always correspond to any similarly sharp drop in homicides. As the next figure shows, while the top five death sentencing counties do have more homicides, the drop in homicides during the past twenty years does not always mirror the drop in sentencing, particularly during the early 1990s and again since the turn of the current decade.

133 Liebman & Clarke, *supra* note 14, at 331.

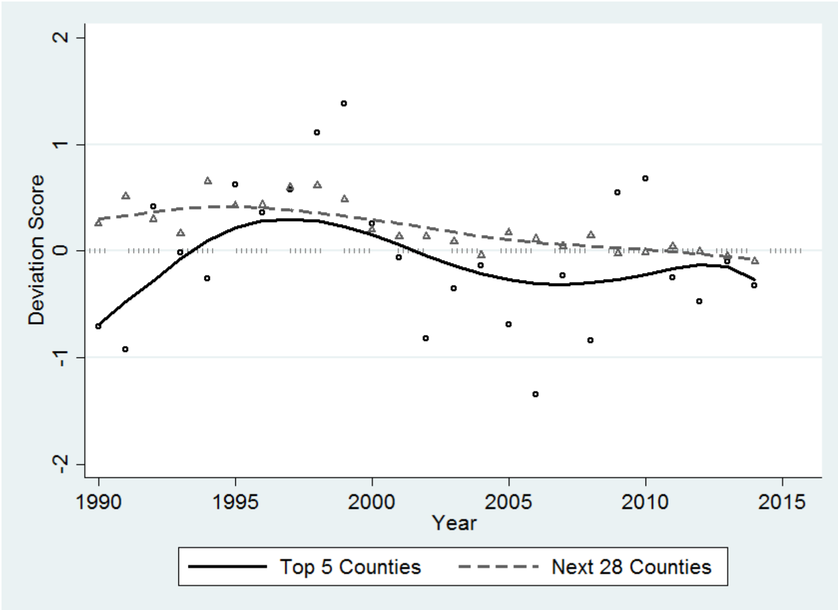
134 The cutoff for inclusion in this second tier was an average of at least one death sentence a year between 1990 and 2016 (i.e., at least twenty-seven death sentences).

Fig. 5. Average Homicides Per County (1990-2014)



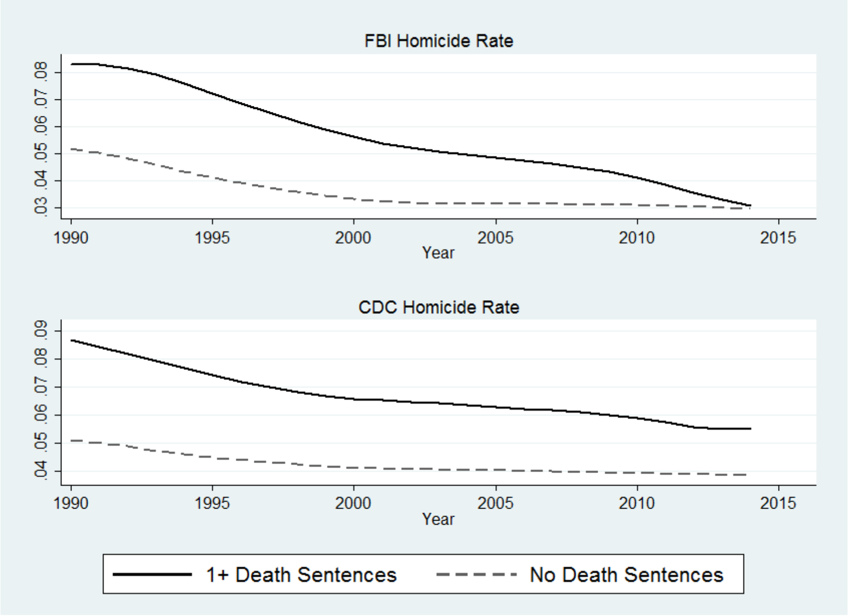
A plot of deviation scores between sentencing counts and homicide rates confirms this pattern, as displayed in Figure 6. Each mark (circles in the case of the top five sentencing counties and triangles for the second-tier counties) represents the deviation score between the average, standardized values of sentencing counts and homicide rates for each year in the dataset. As in previous graphs, trend lines are also added to facilitate interpretation. Positive values indicate that—relative to their average homicide rates—counties sentenced a greater number of individuals to death. Negative values indicate precisely the opposite: counties sentenced proportionally fewer individuals to death than the level of their homicide rates would otherwise suggest. While deviation scores are generally quite low and stable among the second-tier sentencing counties, plotted values for the top five counties are highly variable over time. The top five counties account for nearly 15% of all death sentences issued under the period of investigation, so it is entirely non-trivial that homicide rates do not always accurately mirror sentencing counts.

Fig. 6. Sentencing-Homicide Deviation Plot (1990–2014)



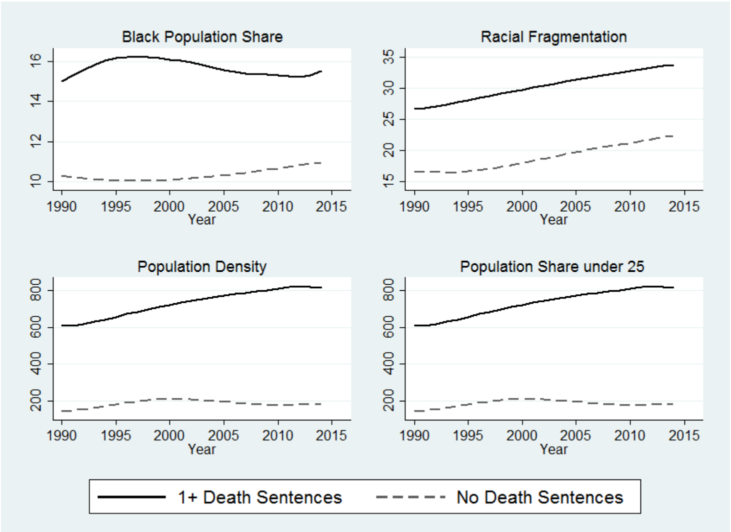
The next figure examines the influence of homicides from a slightly different perspective. Average homicide rates are disaggregated by whether a county issued at least one death sentence (solid line) or not (dashed line) each year between 1990–2014—the most recent year for which homicide data from both the FBI and CDC are currently available. Homicide rates exhibit a general decline over time, but two different stories emerge depending on the data source used. The FBI data portray a quickly narrowing gap between the sentencing and non-sentencing counties that begins in the mid-2000s and narrows precipitously around 2010. By contrast, the CDC data portray a relatively large—albeit slightly narrowing—gap in homicide rates between the groups. This discrepancy is important because it suggests that the choice of homicide indicator can have implications for any inferences we wish to draw on the relationship between violent crime and death penalty sentencing. The analysis will therefore consider the effects of homicide rates derived from both data sources.

Fig. 7. Comparison of County Homicide Rates



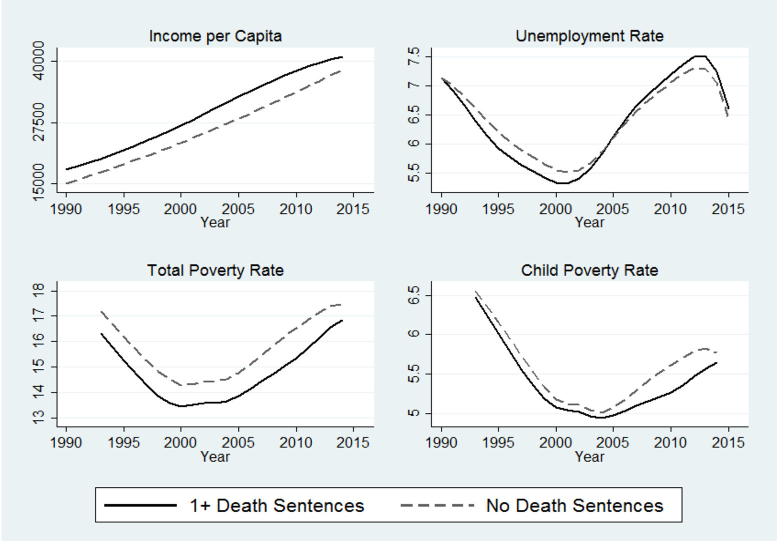
Figures 8 and 9 compare sentencing and non-sentencing counties across additional demographic (Figure 8) and economic (Figure 9) variables. Figure 8 reveals that sentencing counties appear to have more black, racially-fragmented, densely-populated, and youthful populations. The demographic gap between sentencing and non-sentencing counties has narrowed with respect to racial composition, remained relatively constant regarding racial fragmentation, and has actually widened with respect to density and age over time.

Fig. 8. Demographic Trends by Sentencing Status



Economically, sentencing counties appear to be slightly stronger than their non-sentencing counterparts. The sentencing group has higher average income levels, lower poverty rates, and—at least until 2005—lower unemployment rates.

Fig. 9. Economic Trend by Sentencing Status



B. BASELINE ANALYSES

A series of regression results generally confirm—in a much more empirically rigorous fashion—many of the impressions generated from the preceding descriptive trends. Table 1 presents baseline negative binomial regression results using homicide data respectively calculated from the SHR and CDC and controls for the effects of state and time using two different fixed-effects specifications. The number of death sentences in each county-year is modeled as a function of the homicide rate, percentage of the population that is black/African American, population density, and income per capita. The coefficients in these and all subsequent regression tables are presented in the form of factor changes. Coefficients with values less than one indicate an expected *decrease* in the expected number of death sentences, while coefficients with values greater than one indicate an expected *increase* in the expected count. Factor changes can be transformed to percentage changes by subtracting 1 from the observed coefficient value and multiplying the result by 100.

Table 1: Baseline Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Homicide rate	1.098***	1.086**	1.107***	1.083**
	(0.024)	(0.028)	(0.028)	(0.027)
Percent black pop.	1.388**	1.377**	1.361*	1.343*
	(0.157)	(0.154)	(0.167)	(0.163)
Population density	4.480***	4.608***	7.984***	8.704***
	(1.434)	(1.510)	(2.713)	(3.040)
Income per capita	1.406	1.454	0.774	0.817
	(0.599)	(0.620)	(0.359)	(0.378)
Between-Effects				
Homicide rate	1.526***	1.511***	1.557***	1.535***
	(0.138)	(0.127)	(0.143)	(0.130)
Percent black pop.	1.122**	1.122**	1.118**	1.121**
	(0.042)	(0.042)	(0.042)	(0.041)
Population density	2.230***	2.196***	2.248***	2.219***
	(0.089)	(0.091)	(0.088)	(0.090)
Income per capita	1.018	1.175	0.998	1.142
	(0.239)	(0.288)	(0.231)	(0.275)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

The analysis finds strong evidence that counties with proportionally greater black populations and high population densities sentence more individuals to death—both over time (i.e., the *within*-effect) and between counties on average (i.e., the *between*-effect). A one-unit increase in the log of the black share of a county's population increases the expected number of death sentences within counties by an average factor of 1.4 and between counties by an average factor of 1.1. Similarly, a one-unit increase in the log of a county's population density increases the expected death sentence count by an average factor of 6.4 within counties and a factor of 2.2 between counties. In both cases, the within-effects are larger than the between-effects. This suggests that sentencing behavior is more sensitive to longitudinal variations in a county's underlying demographic context than between counties on average, at least with respect to these important demographic characteristics. We consider more fully the implications of this in the next section.

These initial results also support the conventional wisdom that sentencing should be greater in more violent areas. The within- and between-effects[135] of the homicide rates significantly and positively correlate with death sentencing across all four models, but the magnitude of the within-effects is substantively small. A one unit-increase in the logged homicide rate only increases the expected number of death sentences within counties by an average factor of 1.09, or 9%. By contrast, an equivalent increase translates to an average factor increase of 1.53, or 53%, in the number of expected death sentences *between* counties on average. In other words, violent crime appears to exert greater leverage in explaining why some counties generally sentence more people to death than others (i.e., the between-effect) than in predicting whether a given county will sentence more people to death over time (i.e., the within-effect).

The relationship between income per capita and sentencing is less certain. Despite the fact that sentencing counties appeared to be slightly wealthier than their non-sentencing counterparts (Figure 9), the income variable is statistically insignificant across all models. Income may be highly correlated with important omitted variables—such as education level[136]—that may simultaneously influence earnings and attitudes towards death penalty sentencing. Moreover, income may also proxy the resources with which local law enforcement and judicial systems can pursue the death penalty. The death penalty is an expensive proposition for local governments, and many jurisdictions may lack the financial wherewithal to pursue it.[137] Parsing out the distinct mechanisms between income/wealth and sentencing

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[135] The within-effect essentially seeks to assess whether an increase in a county's homicide rate, black population share, population density, and/or income per capita would make that county more or less likely to sentence more individuals to death over time. The between-effect, by contrast, examines the effects of these variables in aggregate; *on average*, do more violent, more black, more densely-population, and/or wealthier counties sentence more individuals to death? This is an important empirical and substantive distinction. *See also* our discussion of the empirical research strategy on page .

[136] *See generally* Brooks & Brady, *supra* note 123.

[137] For a collection of studies of state-wide costs of death sentencing, see *State and Federal Cost Studies*, DEATH PENALTY INFO. CTR., https://deathpenaltyinfo.org/costs-death-penalty#financialfacts; *see also infra* notes 147–152.

behavior is ultimately beyond the scope of this initial empirical foray into modern sentencing behavior, but future work would do well to revisit the political economy of death penalty sentencing with greater theoretical precision and methodological rigor.

C. ANALYSIS OF DISAGGREGATED HOMICIDE RATES

The small within-effect of the homicide rate on sentencing in the previous analysis suggests that total homicide rates may be too imprecise to detect important nuances in any relationship between crime and sentencing. The analysis now disaggregates homicide rates by racial group to assess the presence of any "race-of-victim" effect, whereby deaths involving white victims are more likely to result in the death penalty than when victims are black. Table 2 reports these results.

Table 2: Race of Victim Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
White homicide rate	1.109^{***}	1.108^{***}	1.123^{***}	1.109^{***}
	(0.025)	(0.026)	(0.027)	(0.026)
Black homicide rate	1.059^{*}	1.039	1.066^{*}	1.030
	(0.030)	(0.030)	(0.031)	(0.029)
Percent black pop.	1.406^{**}	1.423^{**}	1.385^{*}	1.400^{**}
	(0.167)	(0.166)	(0.180)	(0.179)
Population density	4.264^{***}	4.518^{***}	7.263^{***}	8.448^{***}
	(1.321)	(1.489)	(2.357)	(2.957)
Income per capita	1.431	1.427	0.782	0.786
	(0.607)	(0.611)	(0.363)	(0.366)
Between-Effects				
White homicide rate	2.173^{***}	2.243^{***}	2.223^{***}	2.286^{***}
	(0.254)	(0.240)	(0.262)	(0.246)
Black homicide rate	0.943	0.965	0.948	0.966
	(0.085)	(0.077)	(0.085)	(0.076)
Percent black pop.	1.295^{***}	1.254^{***}	1.295^{***}	1.255^{***}
	(0.081)	(0.070)	(0.081)	(0.069)
Population density	2.169^{***}	2.129^{***}	2.179^{***}	2.148^{***}
	(0.085)	(0.089)	(0.084)	(0.087)
Income per capita	1.169	1.530^{+}	1.164	1.504^{+}
	(0.278)	(0.379)	(0.274)	(0.368)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

The differences in racial homicide rates are striking. Although the within-effects are still substantively small, the magnitude of a one-unit increase in the white homicide rate is between two and three times greater than in the case of the black homicide rate. Moreover, the within-effect of the white homicide rate is robust across all four models, while the effect of the black homicide rate only passes a lower-threshold of statistical significance ($p < 0.05$) in the case of the FBI homicide data.

In the case of the between-effects, counties with greater white homicide rates sentence substantially more individuals to death, on average. The between-effect of the white homicide rate corresponds to an expected increase in sentencing by an average factor of 2.2, or 120%. By contrast, the between-effect of the black homicide rate is not significantly different from zero in any of the models.

D. ANALYSIS OF LAGGED HOMICIDE RATES

We examine the influence of homicide rates from a third perspective by considering the time delay between arrests and punishments in the American criminal justice system. According to the data we have collected, which is not complete regarding dates of homicides, but provides a rough average across a number of states, the average processing time from the date of the homicide to death sentencing was over a year. If true, it may be more reasonable to assume that sentencing decisions reflect some combination of the current *and/or* historical crime environment. Table 3 re-estimates the baseline regressions using a one-year lag of the total homicide rate using the FBI and CDC data. The substantive implications of a one-unit increase in the lagged homicide rate upon sentencing behavior over time are now greater than in either of the previous modeling approaches. The within-effect of a growth in the lagged homicide rate now increases the expected number of death sentences by an average factor of 1.27, or 27%. The between-effect of the lagged homicide rate is also statistically-significant across all four models, with substantively similar interpretation when compared to the contemporaneous homicide rates used in Table 1.

Table 3: 1-Year Lagged Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Homicide rate at *t-1*	1.234***	1.283***	1.300***	1.282***
	(0.029)	(0.035)	(0.034)	(0.035)
Percent black pop.	1.349**	1.338*	1.318*	1.311*
	(0.153)	(0.153)	(0.163)	(0.163)
Population density	4.629***	4.885***	7.826***	8.830***
	(1.495)	(1.614)	(2.705)	(3.124)
Income per capita	1.382	1.412	0.745	0.774
	(0.599)	(0.600)	(0.354)	(0.359)
Between-Effects				
Homicide rate at *t-1*	1.519***	1.507***	1.550***	1.529***
	(0.138)	(0.127)	(0.142)	(0.129)
Percent black pop.	1.120**	1.119**	1.115**	1.118**
	(0.042)	(0.042)	(0.041)	(0.041)
Population density	2.204***	2.170***	2.212***	2.191***
	(0.088)	(0.090)	(0.086)	(0.088)
Income per capita	1.023	1.160	1.012	1.133
	(0.240)	(0.283)	(0.233)	(0.272)
Observations	62,800	62,794	62,800	62,794
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

The analysis also measures the effect of past violent crime by taking a three-year moving average of the homicide rate (Table 4 below). The results again confirm the positive association between homicide rates and death sentencing counts, as well as the uptick in the substantive within-effect of the homicide rate as compared to the baseline analysis reported in Table 1. Further robustness checks using different lag specifications yield substantively similar results.[138] The results of these supplementary

[138] Models using two-year, three-year, four-year, and five-year lags of the logged homicide rate, as well as a five-year moving average, were also estimated.

regressions are reported in the Appendix. The effects of racial demography and population density are again consistent across all of these models.

Table 4: 3-Year Moving Average Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Homicide rate (3-yr moving avg.)	1.217***	1.454***	1.328***	1.430***
	(0.041)	(0.072)	(0.055)	(0.065)
Percent black pop.	1.366**	1.387**	1.328*	1.997***
	(0.154)	(0.168)	(0.163)	(0.221)
Population density	4.747***	6.040***	8.104***	8.706***
	(1.542)	(2.164)	(2.811)	(2.388)
Income per capita	1.382	1.167	0.747	0.867
	(0.597)	(0.529)	(0.355)	(0.420)
Between-Effects				
Homicide rate (3-yr moving avg.)	1.534***	1.485***	1.561***	1.483***
	(0.139)	(0.125)	(0.143)	(0.063)
Percent black pop.	1.118**	1.126**	1.113**	1.163***
	(0.042)	(0.042)	(0.041)	(0.026)
Population density	2.227***	2.227***	2.238***	2.108***
	(0.088)	(0.094)	(0.087)	(0.044)
Income per capita	1.033	1.099	1.020	0.898
	(0.244)	(0.277)	(0.237)	(0.124)
Observations	62,790	60,342	62,790	60,342
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

E. PATH DEPENDENCY IN DEATH SENTENCING

The findings regarding lag times in homicide processing relates to an additional analysis of inertia within counties over time. We suspected that previous sentencing behavior would cast a long shadow over current sentencing decisions. Not only does time pass between the murder and a death sentence, but prior preferences and outcomes may shape current preferences and outcomes. An initial distribution of policy preferences and resources may predispose some prosecutor's offices to achieve early successes in seeking and obtaining the death penalty. Once an office assembles a staff that has handled a capital trial, it draws upon this capacity to pursue the death penalty in subsequent cases, which further augments the office's institutional capacity to pursue the death penalty. This self-reinforcing dynamic between capacity and caseload makes it more likely for offices that obtain death sentences to seek the death penalty going forward. Conversely, offices that cease to obtain death penalties (or never obtained death penalties in the first place) may be less likely to reverse course as institutional capacity for death penalty sentencing erodes (or is never developed).

We found a highly significant relationship between the sum of all prior death sentences and current-year sentencing (Table 5). We also found a similar relationship between the share of all previous years in which a county sentenced at least one person to death and current-year sentencing (Table 6). In both cases, counties with a proven history of sentencing are more likely to issue more death sentences—both over time and on average. The within-effect of sentencing inertia is particularly large in both tables.

This effect may not just be a prosecution effect. This path dependency may reflect practices of prosecutors who make the charging decisions whether to seek the death penalty, but it may also capture defense lawyering, judges, jurors, and other features of a county that make it more likely to continue to death sentence over time.

Table 5: Sum of All Prior Sentences Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Cumulative death sentences	53.030***	53.318***	59.019***	58.923***
	(12.239)	(12.307)	(12.716)	(12.781)
Homicide rate	1.054*	1.057*	1.092***	1.051+
	(0.023)	(0.029)	(0.028)	(0.028)
Percent black pop.	1.749***	1.790***	1.514***	1.569***
	(0.144)	(0.149)	(0.136)	(0.146)
Population density	1.608	1.585	1.811*	1.813*
	(0.519)	(0.503)	(0.524)	(0.522)
Income per capita	1.845	1.819	1.123	1.095
	(0.708)	(0.708)	(0.463)	(0.462)
Between-Effects				
Cumulative death sentences	2.842***	2.790***	2.870***	2.803***
	(0.125)	(0.124)	(0.122)	(0.121)
Homicide rate	0.796***	0.859*	0.774***	0.845**
	(0.050)	(0.053)	(0.049)	(0.054)
Percent black pop.	1.053+	1.032	1.060*	1.035
	(0.028)	(0.028)	(0.029)	(0.029)
Population density	1.129***	1.138***	1.117**	1.134***
	(0.040)	(0.040)	(0.041)	(0.041)
Income per capita	0.925	0.918	0.907	0.901
	(0.141)	(0.146)	(0.143)	(0.149)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 6: Share of Years with at Least 1 Death Sentence Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Sentencing share of years	90.172*** (14.811)	90.063*** (14.809)	107.811*** (15.459)	96.722*** (13.546)
Homicide rate	0.985 (0.024)	0.964 (0.029)	1.010 (0.028)	0.966 (0.030)
Percent black pop.	1.087 (0.126)	1.095 (0.125)	1.008 (0.126)	0.980 (0.153)
Population density	2.717** (0.897)	2.754** (0.915)	1.996* (0.663)	2.054* (0.694)
Income per capita	1.190 (0.476)	1.197 (0.478)	0.754 (0.314)	0.641 (0.304)
Between-Effects				
Sentencing share of years	3.776*** (0.209)	3.763*** (0.208)	3.865*** (0.216)	3.882*** (0.241)
Homicide rate	1.087 (0.077)	1.127+ (0.078)	1.113 (0.081)	1.189* (0.091)
Percent black pop.	1.018 (0.029)	1.006 (0.029)	1.013 (0.030)	1.004 (0.032)
Population density	1.297*** (0.055)	1.288*** (0.054)	1.296*** (0.056)	1.298*** (0.060)
Income per capita	0.791 (0.155)	0.839 (0.168)	0.809 (0.163)	0.812 (0.204)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

F. ROBUST RESULTS

Before discussing the implications of these findings, it is important to note that all of these analyses were subject to several robustness checks. First, all models were re-specified using a series of Poisson regressions. While it is generally acknowledged that the negative binomial regression model is the preferred choice when estimating overdispersed counts, the tradeoff between the negative binomial and Poisson regression models grows more complicated in the context of longitudinal, hierarchically arranged data. Counties are observed repeatedly over time between 1990 and 2016, and counties are nested within states. For instance, a random-effects negative binomial regression uses the same parameter to predict both the county-specific random intercept *and* the amount of over-dispersion in the data. In practice, this means that it is not possible to have heterogeneity at the county-level without also having over-dispersion at the county-year-level (or vice versa). This is problematic if the data are over-dispersed at some levels of the dependent variable but not at others.[139] For these and similar reasons, Rabe-Hesketh and Skrondal do not recommend the use of random-effects negative binomial models.[140] Additionally, work by Cameron and Trivedi contends that the efficiency gains of the negative binomial over the Poisson regression are less noticeable when modeling longitudinal data.[141]

Second, models were re-estimated using their original, untransformed values. Transformation is a common practice in the literature because it can facilitate model convergence and mathematically-express theoretically-important distributions, such as the decreasing marginal utility of income.[142] However, variable transformations can occasionally generate non-trivial deviations from the original distributions of key covariates. The relationships observed in the previous analyses could thus be artifacts of the transformation process. This is especially true when arbitrary start values are added to the data to avoid taking the log of 0, as is the case for many of the homicide rate variables.[143]

Finally, we re-estimate models by periodizing the results into five-year increments.[144] This helps detect any temporal heterogeneities in the effects among the covariates. These models are estimated using traditional-mixed effects negative binomial regressions with random county-effects and fixed effects for each state and year. The shorter time horizon within each period

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139 SOPHIA RABE-HESKETH & ANDERS SKRONDAL, MULTILEVEL AND LONGITUDINAL MODELING USING STATA 712 (3d ed. 2012).

140 *Id.*

141 A. COLIN CAMERON & PRAVIN K. TRIVEDI, REGRESSION ANALYSIS OF COUNT DATA 133 (2d ed. 2013). We nonetheless feature negative binomial regressions in the main body of the article because it follows common practice in previous scholarship examining longitudinal determinants of death sentencing across counties and states. *See* LIEBMAN ET AL., *supra* note 13.

142 FOX, *supra* note 127.

143 *See supra* note 128.

144 Results are disaggregated into the following periods: 1990–1994; 1995–1999; 2000–2004; 2005–2009; 2010–2014.

(five years) does not warrant disaggregating the effects into their constituent *within* and *between* components as in the conditionally-correlated models used in the remainder of the analysis since most of the detectable variation will be cross-sectional (i.e., between counties instead of within them).

The results of these various robustness checks are listed, along with basic descriptive statistics, in the Appendix. Re-estimation using the Poisson distribution yielded substantively similar results, but the use of the originally-scaled, non-transformed covariates produces a slightly more muddled understanding of the key relationships in the study.

On the one hand, these non-transformed analyses generally confirm previously identified relationships regarding the between-effect of all contemporaneously-measured homicide rates, the influence of lagged homicide rates, and the effect of population density. The role of racial demography, the presence of a race of victim effect, and the role of sentencing inertia are partially-reaffirmed. Racial composition is more strongly associated with increased sentencing within counties than between them, while the strong disparity between white and black homicide rates and sentencing persists more strongly between counties than within them. Measuring inertia as the share of years where at least one individual was sentenced to death produces results that are more consistent with the main empirical findings than using the cumulative share of all death sentences. On the other hand, the effect of income is completely different than before; a strong positive association with sentencing is now identified within most models, particularly in the case of the between-effect.[145]

Results from the final robustness check using an expanded set of covariates using multiple imputation validate this claim. The effects of the homicide rate (contemporaneous, disaggregated by victim, and lagged), racial demography, and population density are largely internally-consistent across each of the five periods and generally mirror the substantive implications of the main analysis. The effect of income per capita is more variable across periods, but this comports with the lack of consistent and significant results found in the main analysis.

III. PRACTICAL AND CONSTITUTIONAL IMPLICATIONS OF STUDY FINDINGS

In this Part, we discuss the implications of these findings. The first sections discuss each of the main findings described in Part II, beginning with

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[145] We caution that drawing general conclusions from this second set of robustness checks is difficult since many of these models failed to converge because of the non-linearities introduced when using the covariates in their originally-scaled forms. These results and their accompanying discussion are included mainly in the interest of transparency.

the findings concerning population density, race, and then the findings regarding homicide rates and path dependency in death sentencing. This Part then concludes by discussing larger implications for death penalty research and for litigation.

A. POPULATION DENSITY FINDINGS

The above analysis describes a consistent and strong relationship between population density and death sentencing. Take as an example the state of Virginia, in which in the 1980s and 1990s, dozens of small counties regularly imposed death sentences.[146] In the past decade only *seven* counties imposed any death sentences, and most were large, densely populated counties, like Fairfax County, the largest county in Virginia, and Virginia Beach, the largest city in Virginia.[147]

It may be that large counties are more likely to absorb the costs of seeking the death penalty, which may be borne in part by local prosecutors, courts, and law enforcement, as well as local public defenders. Costs of death penalty cases can be enormous. A Maryland study found costs in cases resulting in death sentences averaged $3 million per case and the cost to state taxpayers of the death penalty would be $186 million.[148] Colorado came close to abolishing the death penalty in 2009 due to concern with the $4 million a year in costs, despite a small death row.[149] In Georgia, a death penalty trial ran up over $3 million in just the defense costs.[150] The State of New York estimated that the death penalty cost $1.8 million per case, for trials and then appeals.[151] In North Carolina, it cost $11 million per year to litigate death penalty cases through trial from 2007 to 2008, when there were twenty-five capital trials and just four death sentences.[152] Those costs fall on prosecutors, but also the courts, prisons, public defenders' offices, and others, like state attorney generals who must typically defend appeals and post-conviction

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146 For a description of this pattern and a case study of the decline in Virginia death sentencing, see GARRETT, END OF ITS ROPE, *supra* note 4.

147 *Id.* at 6.

148 JOHN ROMAN ET AL., URBAN INSTITUTE, THE COST OF THE DEATH PENALTY IN MARYLAND 2 (2008), http://www.urban.org/UploadedPDF/411625_md_death_penalty.pdf.

149 Morgan Carroll & Paul Weissmann, Editorial, *Revisit Death Penalty Bill*, DENVER POST (May 21, 2009), http://www.denverpost.com/2009/05/20/revisit-death-penalty-bill/.

150 Steve Visser & Rhonda Cook, *Nichols' Defense Costs $3.2 Million – State, Fulton County Had to Foot the Bill*, ATLANTA J. CONST. (July 22, 2009) at B1.

151 Kelly Phillips Erb, *Considering The Death Penalty: Your Tax Dollars At Work*, FORBES (May 1, 2014) https://www.forbes.com/sites/kellyphillipserb/2014/05/01/considering-the-death-penalty-your-tax-dollars-at-work/#cb1066664b3d.

152 Philip J. Cook, *Potential Savings from Abolition of the Death Penalty in North Carolina*, 11 AM. L. AND ECON. REV. 498, 498 (2009).

proceedings. While we observed strong population density effects,[153] the effect of income per capita was largely insignificant in the analysis. Nevertheless, the existence of a resource effect is still probable. The effect of income is likely correlated with other factors—such as education or partisanship—and income data may not be the most valid proxy for the resource capacity of local criminal justice systems.

B. RACE OF VICTIM AND DEMOGRAPHIC FINDINGS

The findings regarding the consistent effects of the percentage of black population in counties, as well as the findings regarding the association between murders with white victims and death sentencing, add to the large body of evidence regarding race discrimination in death sentencing that has steadily accumulated since the Supreme Court declined to place any constitutional weight on the findings of the landmark Baldus study in its 1987 ruling in *McCleskey v. Kemp*.[154] We are examining the characteristics of all homicides in counties and not just the particular cases resulting in death sentences. Indeed, researchers have found still larger disparity in the race of victims in cases in which there is ultimately an execution; among those cases a disturbing 75% of the cases involved only white victims.[155] What these data add is national data, across all death-sentencing states, over a twenty-five year time period. Of course, as described, the Baldus findings have also been replicated in intensive studies of almost every state's death sentencing, with empirical work examining the characteristics of all murders or death eligible murders in each given state.[156] These data do add something to that already troubling picture, by confirming that even in an era of declining death sentencing, concerns about race discrimination persist, and they continue to be centered around race-of-victim effects.

C. HOMICIDE RATE FINDINGS

We identify a positive association between homicide rates and death sentencing. The national decline in homicide rates should have reduced the

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[153] For instance, the results from Table 1 report that—on average—a one-unit increase in the log of population density was associated with nearly a 570% increase the expected number of death sentences within counties and roughly a 120% increase between counties.

[154] 481 U.S. 279, 287–91 n.6 (1987).

[155] Professor Frank Baumgartner has collected data on executions in the United States from 1976 through 2015. Examining that data, one observes that among the 1,422 people executed in the United States from 1976 through 2015, 15% or 210 of 1422 involved at least one black victim. In contrast, 75% or 1070 of the 1,422 cases involved only white victims. Baumgartner*, supra* note 17.

[156] *See, e.g.*, Grosso et al., *supra* note 11; U.S. GEN. ACCT. OFF., *supra* note 11. For an additional overview, see David C. Baldus et al*., supra* note 80, at 500–01.

supply of cases that could result in death sentences across all counties—and we generally find empirical evidence that supports this intuition. Although the concordance between homicide rates and death sentencing is far from exact (see Figures 4, 5, and 6 for an empirical overview), the two variables do tend to mirror each other: a rise or decline in one generally corresponds with a similar response in the other. These results were consistent across the FBI and CDC data sources, and we also found strong evidence of a race-of-victim effect. A one-unit increase in the logged white homicide rate corresponded with an average increase in the expected number of death sentences by 11% within counties and 123% between counties. By contrast, the effect of a one-unit increase in the logged black homicide rate was generally insignificant—both with respect to the within- and between-effects.

However, the between-effects of the homicide rate were generally of larger substantive value than the within-effects. This could be because key local preferences and idiosyncrasies overshadow or—at least—heavily moderate the objective influence of a changing homicide rate upon sentencing behavior within a given county over time. Future research would do well to explore this possibility in greater detail. The relationship between homicide rates and sentencing was stronger—particularly within counties—when lagging homicide rates by one to three years. After all, it takes time for an investigation and a trial to result in a death sentence.

However, this lag may also overlap with the path dependent preferences of death sentencing counties. As described, those that obtain death sentences become far more likely to do so again. These results together suggest that preferences at the county level, and not purely the supply of murders, drive death sentencing. Whether death sentences are handed down may depend, as Professor James Liebman and Peter Clark put it, on "the practices, policies, habits, and political milieu of local prosecutors, jurors, and judges that dictate whether a given defendant in the United States—whatever his crime—will be charged, tried, convicted, and sentenced capitally and executed."[157] We cannot say whether the patterns observed are due to prosecutors' preferences, or those of jurors, judges, or defense lawyers, as well. We can only observe that there are these significant associations between death sentencing and factors like population, race, lagged murder rates, and prior death sentences over time.

D. EIGHTH AMENDMENT IMPLICATIONS

Since the Supreme Court's ruling in *Furman v. Georgia,* the federal courts have been occupied with whether under the Eighth Amendment, death

[157] Liebman & Clarke, *supra* note 14, at 262.

sentencing is "wantonly" or "freakishly" imposed.[158] Yet the Supreme Court has not closely considered statistical studies of death sentencing since it rejected the findings of the Baldus study in *McCleskey*.[159] Perhaps given the Justices' prior rulings, it is less likely that "data-driven arbitrariness review" will take on a more prominent role, even with the benefit of detailed new county-level data on death sentencing.[160] While evidence of racial discrimination in death sentencing has not been carefully and directly considered by the U.S. Supreme Court since *McCleskey*,[161] a different type of empirical debate has played an increasingly prominent role in the Court's rulings—a debate concerning evidence of the rarity and arbitrariness of particular death penalty practices.

In its Eighth Amendment rulings concerning "evolving standards of decency" and the meaning of cruel and unusual punishment, the Court has highlighted how few states or how few death sentences have been carried out for certain types of defendants as "objective indicia of national consensus" concerning the form of punishment.[162] In 1988 in *Thompson v. Oklahoma,* a plurality of the Justices concluded the Eighth Amendment barred execution of an individual who was less than sixteen years-old at the time of the offense; at the time thirty-two legislatures barred the practice and none had permitted it explicitly.[163] However, in 1989 in *Penry v. Lynaugh,* the Court held that execution of the intellectually disabled was permitted where "the two state statutes prohibiting execution of the mentally retarded, even when added to the fourteen States that have rejected capital punishment completely, [did] not provide sufficient evidence at present of a national consensus."[164] In the same year, in *Stanford v. Kentucky,* the Court concluded that where twenty-two of thirty-seven death penalty states permitted the death penalty for sixteen year-old offenders, and twenty-five permitted it for seventeen year-olds, there was no national consensus "sufficient to label a particular punishment cruel and unusual."[165]

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[158] 408 U.S. 238, 310 (1972) (Stewart, J., concurring); *see, e.g.*, Gregg v. Georgia, 428 U.S. 153, 207 (1976); Jurek v. Texas, 428 U.S. 264, 276 (1976).

[159] 481 U.S. 279, 287–91 n.6 (1987).

[160] Smith, *supra* note 4, at 254. Professor Smith also calls for the collection of still more detailed charging data regarding all potentially capital cases and examining what factors influenced processing and outcomes. *Id.* at 256.

[161] An exception was *U.S. v. Bass*, 536 U.S. 862 (2002), in which the Court, in a per curiam opinion, rejected as insufficient evidence regarding race disparity in federal death sentencing.

[162] *See, e.g.*, Roper v. Simmons, 543 U.S. 551, 563–64 (2005).

[163] 487 U.S. 815, 827–29 (1988).

[164] 492 U.S. 302, 334, 371 (1989).

[165] 492 U.S. 361, 370–71 (1989).

The state of national consensus had changed by the time *Atkins v. Virginia* was decided in 2002. The Court noted sixteen states had barred the death penalty for the intellectually disabled—and even in those states where the death penalty for the intellectually disabled was permitted, such death sentences were rare, with only five states having done so since 1989—the death penalty for the intellectually disabled was "truly unusual, and it is fair to say that a national consensus has developed against it."[166] In *Ring v. Arizona*, the Court noted how "the great majority of States responded to this Court's Eighth Amendment decisions requiring the presence of aggravating circumstances in capital cases by entrusting those determinations to the jury."[167]

In abolishing the juvenile death penalty in its 2005 ruling in *Roper v. Simmons*, the U.S. Supreme Court described how even fewer states permitted the juvenile death penalty as compared to the intellectually disabled.[168] Thirty states prohibited the juvenile death penalty.[169] Although twenty states did not formally prohibit it, the execution of juveniles was so infrequent that few examples could be identified in recent years.[170] To be sure, the Justices noted that the "rate of change" regarding the juvenile death penalty was slower than the rate of change concerning the death penalty for the intellectually disabled.[171] Yet the Court emphasized the "consistency in the direction of change" during those years.[172] Dissenting in *Roper v. Simmons,* Justice Antonin Scalia argued: "Words have no meaning if the views of less than 50% of death penalty States can constitute a national consensus."[173] In its ruling in *Kennedy v. Louisiana*, the Supreme Court held that the Eighth Amendment barred executing an individual for a person who raped but did not kill a child.[174] The Court noted that the last known person executed for that crime was in 1964, and while forty-four states and the federal government barred the death penalty for child rape, only six states did.[175]

The Court has considered not just state-level practices, but local practices, although not county-level differences per se. Justice Scalia noted in his dissent: "[W]e have, in our determination of society's moral standards,

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166 Atkins v. Virginia, 536 U.S. 304, 316 (2002).
167 536 U.S. 584, 607–08 (2002).
168 543 U.S. 551, 577–78 (2005).
169 *Id.* at 564.
170 *Id.* at 565.
171 *Id.*
172 *Id.*
173 *Id.* at 609 (Scalia, J., dissenting).
174 554 U.S. 407, 446–47 (2008).
175 *Id.* at 423.

consulted the practices of sentencing juries: Juries 'maintain a link between contemporary community values and the penal system' that this Court cannot claim for itself."[176] The marked reluctance of juries, even more so in the past decade, to impose death sentences across the country adds some power to the Eighth Amendment argument in favor of abolition. The Court argued in rulings like *Atkins v. Virginia* that there may be little need for states in which no executions have been carried out in decades, to reconsider their death penalty statutes.[177] The same may be true of states in which the death penalty exists on the books, but there have been no death sentences for years.

Eighth Amendment concerns should be heightened today now that in the thirty-one states in which the death penalty exists on the book, only a handful of counties still sentence persons to death. In 2016, only thirteen states imposed death sentences—and only twenty-six counties.[178] For the entire period from 2010–2016, only sixteen counties imposed more than five death sentences.[179] Those constitute only .005% of the approximately 3,000 counties in the United States. The rate of change and the "consistency in the direction of change" in the past two decades is marked.[180] Perhaps the Court will engage with these county-level data in analyzing objective indicia of contemporary values in the future.

That said, decisions like *Atkins, Roper,* and *Kennedy* dealt with specific categories of capital defendants and not the broader argument that the entire death penalty is now a rare and arbitrary event in this country. The Court turned decades ago from examining particular methods of execution to death sentencing more broadly: it is not a stretch for the Court to engage with the troubled state of American death sentencing.[181] However, the Court in *McCleskey v. Kemp*, declined to rule in favor of the inmate based on the findings of the Baldus Study regarding death sentencing in Georgia.[182] In

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[176] *Roper*, 543 U.S. at 616 (2005) (Scalia, J., dissenting) (quoting Witherspoon v. Illinois, 391 U.S. 510, 519 n.15 (1968)); s*ee also* Furman v. Georgia, 408 U.S. 238, 314 (1972) (Marshall, J., concurring) ("Legislative 'policy' is thus necessarily defined not by what is legislatively authorized but by what juries and judges do in exercising the discretion so regularly conferred upon them.").

[177] *See, e.g.*, 536 U.S. 304, 316 (2002).

[178] *See* Bazelon, *supra* note 3, at 43–44; *see also* GARRETT, END OF ITS ROPE, *supra* note 4, at Ch. 6.

[179] Garrett, *End of its Rope*, *supra* note 4, at Ch. 6.

[180] *Roper*, 543 U.S. at 565.

[181] Gregg v. Georgia, 428 U.S. 153, 170 (1976) ("In the earliest cases raising Eighth Amendment claims, the Court focused on particular methods of execution to determine whether they were too cruel to pass constitutional muster. The constitutionality of the sentence of death itself was not at issue.").

[182] 481 U.S. 279, 292 (1987).

McCleskey, the Court addressed two questions: first, whether discriminatory purpose could be inferred from a statewide policy or practice of discrimination, and second, the Eighth Amendment question whether this evidence provided evidence of arbitrariness.[183] Regarding the Eighth Amendment claim, the Court assumed that the findings of the Baldus study were valid, but nevertheless found them inadequate to show that the Georgia death penalty system operated in an arbitrary manner, including that although there is "some risk of racial prejudice influencing a jury's decision," the state statutes had already been approved by the Court for the manner in which they guided discretion to jurors.[184] The Court also emphasized that "[a]pparent disparities in sentencing are an inevitable part of our criminal justice system," so that the Justices would not "assume that what is unexplained is invidious," particularly where the discretion involved could call "into serious question the principles that underlie our entire criminal justice system."[185] For Equal Protection purposes, the Court emphasized that "decisions whether to prosecute and what to charge necessarily are individualized."[186]

Perhaps the findings in this study concerning the role of race and the race of victims would have less impact than the classic Baldus study, which had the advantages of remarkable comprehensive detail regarding all murder cases in a state. The findings in this study similarly show arbitrariness and bias in the operation of the discretionary features of our criminal justice system. This study involves nationwide data and not data concerning just one state. However, the U.S. Supreme Court noted in *United States v. Bass,* a case challenging race discrimination in the federal death penalty, real discomfort with "a nationwide showing" of statistics regarding race in death sentencing.[187] To be sure, a renewed Eighth Amendment argument based on data from this study and a substantial body of research that has accumulated since the time of *McCleskey*, could proceed differently. A modern analysis would ask whether arbitrariness of several types, as to prosecutorial charging, race discrimination, defense resources, local geography, each contribute to cruel and unusual punishment. That arbitrariness is manifest at the local level, as well as in patterns observed across counties nationally.

A response might be that observed county-level variation in enforcement, if it does not amount to unconstitutional race discrimination, is not of constitutional concern since it is built into our localized system of enforcement. Kent Scheidegger has argued "so-called geographic disparity"

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183 *Id.* at 301–11.

184 *Id.* at 308–09.

185 *Id.* at 315.

186 *Id.* at 295.

187 536 U.S. 862 (2002).

is not a problem "on the same order as race discrimination," and in fact any such concern runs "flatly contrary to the American tradition of local control."[188] The Supreme Court emphasized as much in *McCleskey,* in its discussion of why local discretion by prosecutors and jurors is essential to criminal justice.[189] Of course, we observe racially disparate patterns in death sentencing and we observe local inertia unconnected to any comparatively greater degree or homicide victimization. These are not common and local policy preferences, but biased preferences of a small handful of counties.

A slightly different Eighth Amendment argument based on geographic disparity and infrequency has now been posed at the Supreme Court. In 2014, in his dissent in *Glossip v. Gross,* calling for further consideration of the question whether the death penalty has become categorically unconstitutional, Justice Breyer, joined by Justice Ginsburg, emphasized that the death penalty has "increasingly become unusual," having "declined rapidly" in the last fifteen years, raising heightened Eighth Amendment concerns.[190] He explained: "Geography also plays an important role in determining who is sentenced to death . . . Between 2004 and 2009, for example, just 29 counties (fewer than 1% of counties in the country) accounted for approximately half of all death sentences imposed nationwide."[191]

That reasoning could be buttressed by these findings concerning the relationship between population density, race, and the complex relation of lagged homicide rates and path dependency that explains death sentencing in those few counties that still engage in the practice.[192] Justice Breyer emphasized in his *Glossip* dissent the concern with arbitrariness not just due to the role of local geography but that county-by-county disparity might be caused by troubling factors such as availability of resources for defense counsel, political pressures, and "racial composition of and distribution within a county."[193]

Thus, in cases like *Atkins, Roper,* and *Kennedy*, the Supreme Court has

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[188] Kent Scheidegger, *Smoke and Mirrors on Race and the Death Penalty*, 4 ENGAGE 42, 44 (2003).

[189] 481 U.S. 279, 311 (1987).

[190] 135 S. Ct. 2726, 2757 (2015) (Breyer, J., dissenting).

[191] *Id.*

[192] For an in-depth discussion of the questions raised by a broader definition of Eighth Amendment arbitrariness, see Kovarsky, *supra* note 4, at 328–330. One question Kovarsky raises is whether "residing in the wrong county" should be considered arbitrary. *Id.* at 329. The analysis here suggested that further "irrelevant variables" are associated with the reduction and concentration of death sentencing, including variables like race that the Court has already recognized as associated with arbitrariness concerns. *Id.*

[193] *Glossip*, 135 S. Ct. at 2758.

recognized Eighth Amendment violations for practices used by far more states than the current death penalty, which is now maintained by just a scattered collection of counties. Today, the majority of states with the death penalty on the books do not impose death sentences and even fewer have executions;[194] the story is still more powerful when one focuses on counties. Death sentences are now at the same low-point they had reached just before the Court's ruling in *Furman v. Georgia.*[195] Whether other Justices will agree, along with Justices Breyer and Ginsburg, that further briefing on this issue is warranted and that new Eighth Amendment concerns now exist, time will tell. However, these findings suggest that the splintered geography and infrequency of county-level death sentencing are only part of the problem: far more troubling are the characteristics of those counties that disproportionately engage in death sentencing, including that they exhibit bias towards urban centers, racially biased sentencing patterns, and substantial path dependency.

E. IMPLICATIONS FOR FUTURE DEATH PENALTY TRENDS

These data suggest that the death penalty will continue its steady decline. To be sure, death penalty trends have reversed themselves in the past; death sentences increased dramatically following the Supreme Court's ruling in *Furman,* and they continued to increase through the 1990s.[196] However, the decline in death sentencing has been two decades in the making, and a reversal might take some time. These trends are therefore likely to persist, even if the portion of death sentencing that is linked to homicide rates may change if homicide rates increase in the future.

The decline in death sentencing is international and not limited to the United States. The concern with arbitrariness in death sentencing is reflected in not just the Eighth Amendment but in international treaties. Article 6 of the International Covenant on Civil and Political Rights (ICCPR) states that: "Every human being has the inherent right to life," and that "[n]o one shall be arbitrarily deprived of his life."[197] As Professor David Garland has described, we live in a global "age of abolition," and around the world, as countries have made the death penalty a subject for national and not local

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194 *See The Death Penalty in 2016: Year End Report* 4, DEATH PENALTY INFO. CTR. (2016), http://deathpenaltyinfo.org/documents/2016YrEnd.pdf (noting that in 2016, thirteen states and twenty-seven counties imposed death sentences, while only seven states conducted executions).

195 *Id.* at 1.

196 *Id.*

197 International Covenant on Civil and Political Rights art. 6, G.A. Res. 2200A, 21, U.N. GOAR, 21st Sess., Supp. No. 16, U.N. Doc. A/6316 (1966).

regulation, death sentences have been limited and the penalty itself abolished.[198] Where the death penalty persists, however, it is because it presents political opportunities for local stakeholders. In the U.S., those opportunities appear to be fading.

F. IMPLICATIONS FOR CRIMINAL JUSTICE

The county-level death penalty decline has implications for debates about localism in criminal justice more broadly. We have described how more counties have stopped seeking or successfully obtaining death sentences. Professor Adam Gershowitz has argued that perhaps the counties' role in death sentencing should be eliminated entirely—that a broader constituency should decide whether death sentences are merited, such as a state capital prosecutor.[199] Professors Stephen Smith and James Liebman have responded that it is state subsidization that enabled the rise in death sentences in the first place.[200] A common ground on both sides of that argument is that all agree that local counties should not be able to shunt the costs of expensive capital litigation on the rest of the state without internalizing many of those cases.[201] Perhaps one reason the death penalty decline has been so sharp is that the counties that pursue death sentences most aggressively have had to bear more of the costs.

In some cases, the Supreme Court has emphasized how deference to "the vagaries of state criminal law" can result in a "crazy quilt" rather than "uniform law of the land."[202] Perhaps constitutional criminal procedure should more generally be sensitive to potentially arbitrary variation in enforcement. If something as grave as capital punishment can be so sensitive to local prosecution priorities, then that raises the question whether and why we tolerate such widely varying imposition of other types of punishments, such as life without parole.

A series of reforms could improve state-level support for criminal justice and minimize local arbitrariness, and not just for death sentencing. Nineteen states and localities have enacted "smart on crime" justice

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[198] GARLAND, *supra* note 3, at 11.

[199] Adam Gershowitz, *Statewide Capital Punishment: The Case for Eliminating Counties' Role in the Death Penalty*, 63 VAND. L. REV. 307, 324 (2010).

[200] Liebman & Clarke, *supra* note 14, at 312. Smith, *supra* note 4, at 236 ("The fact that the political decision to perform an execution is one step removed from the citizens in the county who imposed the sentence means that it is possible for a backlog of executions to remain even though local taste for capital punishment has subsided.").

[201] Liebman & Clarke, *supra* note 14, at 312.

[202] Rothgery v. Gillespie County, 128 S. Ct. 2578, 2584 n.9 (2008); Kansas v. Marsh, 548 U.S. 163, 185 (2006) (Scalia, J., concurring).

reinvestment measures designed to reduce sentences, expand parole, and reinvest cost savings in alternatives to incarceration.[203] Reducing mass incarceration, since the vast majority of prisoners are imprisoned in state facilities, will require interventions at the state level.[204] Many states and localities are beginning to take such steps, although given the scale of the increase in incarceration, sustained work will be needed.

CONCLUSION

Even the most prominent death sentencing counties have experienced large declines in death sentencing—in fact they have experienced the largest declines. No one expected or predicted such a rapid nationwide decline. The death penalty has nearly vanished, and just a handful of outlier counties still sentence people to death. Most of the counties that sentenced people to death in the 1980s and 1990s no longer do so today.

As we describe in this Article, this decline does not reflect just one cause. Yet there is a great deal of consistency in the patterns observed over the years from 1990 to 2016, in which death sentences declined so dramatically. During that time period, we observed a consistent relationship between population density and death sentencing. The rural and less-populated counties largely ceased imposing death sentences. Resource constraints may play a critical role in the death sentencing decline. Second, even among the relatively larger death sentencing counties, death sentences are associated with counties with proportionally-greater black populations. Third, homicide rates, when lagged by several years, are statistically associated with death sentencing. But not all homicides are treated equally. It is homicides with white victims that are correlated with death sentencing trends. Finally, we observe a path dependency in which counties that sentence more people to death continue to do so in relatively higher numbers. The converse is that when a county stops death sentencing it may be unlikely to reverse course and do so again.

The decline of the death penalty may be part of its undoing under the U.S. Constitution, since it makes the death penalty more and more "unusual" under the Eighth Amendment. The shrinking geography of the death penalty has not escaped the notice of judges. In 2014, Justice Breyer emphasized in his dissent in *Glossip v. Gross* that the death penalty has "increasingly

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[203] Office of Justice Programs, *What is JRI?*, JUSTICE REINVESTMENT INITIATIVE (May 15, 2017), https://www.bja.gov/programs/justicereinvestment/what_is_jri.html; Jason Pye, *Savings from Prison Reforms in Texas Top $3 Billion Crimes Rates Hit Lowest Point Since 1968*, FREEDOM WORKS (July 6, 2015), http://www.freedomworks.org/content/savings-prison-reforms-texas-top-3-billion-crimes-rates-hit-lowest-point-1968.

[204] *See generally* GARRETT, END OF ITS ROPE, *supra* note 4, at ch. 10.

become unusual," having "declined rapidly" in the last fifteen years, raising heightened Eighth Amendment concerns.[205] Death sentences are at the low-point reached just before the U.S. Supreme Court's ruling in *Furman v. Georgia.* It is not just the raw fact of the decline that is troubling, but the degree of arbitrariness reflected in these data. Lawyers will increasingly use these data to show how few counties actually impose death sentences and how arbitrary it is which counties still use the death penalty.

Whether or not the courts, state or federal, further regulate the process, the death penalty is disappearing on the ground. What remains of the death penalty is not just rare and geographically dispersed, but highly dependent on path dependency and insidious factors such as race. The extreme disparities in death penalty cases are an emblem for larger disparities in the enforcement of criminal law. The decline of the American death penalty provides a larger lesson: we must ensure that arbitrariness in local punishment does not undermine the fairness of our system of justice.

APPENDIX

I. SUMMARY AND DESCRIPTIVE STATISTICS

Table A1: Descriptive Statistics

Variable	Category	Mean	Std. Deviation	Min	Max	N
Death sentences	Overall	0.08	0.49	0.00	17.00	62,803
	Between		0.34	0.00	8.24	2,612
	Within		0.34	-7.16	10.52	24.04
FBI total homicide rate	Overall	0.04	0.07	0.00	2.61	62,803
	Between		0.04	0.00	0.52	2,612
	Within		0.06	-0.48	2.55	24.04
FBI black homicide rate	Overall	0.01	0.04	0.00	1.62	62,803
	Between		0.03	0.00	0.46	2,612
	Within		0.03	-0.45	1.55	24.04
FBI white homicide rate	Overall	0.02	0.06	0.00	2.61	62,803
	Between		0.02	0.00	0.29	2,612

[205] 135 S. Ct. 2726, 2775 (2015) (Breyer, J., dissenting).

	Within		0.06	-0.27	2.53	24.04
CDC total homicide rate	Overall	0.04	0.07	0.00	2.34	62,803
	Between		0.04	0.00	0.56	2,612
	Within		0.06	-0.20	2.19	24.04
CDC black homicide rate	Overall	0.01	0.04	0.00	0.71	62,803
	Between		0.03	0.00	0.49	2,612
	Within		0.03	-0.20	0.67	24.04
CDC white homicide rate	Overall	0.03	0.06	0.00	2.34	62,803
	Between		0.02	0.00	0.19	2,612
	Within		0.05	-0.16	2.18	24.04
Black population share	Overall	10.56	15.62	0.00	86.90	62,803
	Between		15.38	0.00	86.16	2,612
	Within		1.22	-18.13	33.63	24.04
Population density	Overall	212.36	1,138.42	0.08	68,038.06	62,803
	Between		1,707.19	0.13	60,765.29	2,612
	Within		93.36	-6,944.23	7,485.13	24.04
Income per capita	Overall	25,795.19	9,875.94	5,081.58	194,484.61	62,803
	Between		6,738.54	13,174.46	133,412.06	2,612
	Within		7,636.93	-38,645.83	120,673.45	24.04
Poverty rate	Overall	15.41	6.10	1.86	57.80	50,349
	Between		5.71	2.79	44.92	2,612
	Within		2.15	0.18	35.34	19.28
Unemployment rate	Overall	6.36	2.98	0.52	40.44	62,789
	Between		2.24	1.04	23.49	2,612
	Within		1.96	-5.14	30.18	24.04
Population share under 25	Overall	34.15	4.82	3.40	66.66	62,803
	Between		4.52	3.68	64.42	2,612
	Within		1.69	23.31	45.40	24.04
Cumulative death sentences	Overall	2.76	11.65	0.00	314.00	62,803
	Between		11.20	0.00	251.64	2,612

	Within		2.63	-112.88	91.08	24.04
Share of years with 1+ death sentence	Overall	5.08	10.95	0.00	91.11	62,803
	Between		10.71	0.00	87.24	2,612
	Within		1.53	-17.48	24.42	24.04

Table A2: State Death Sentences, 1990-2016

State	Death sentences	Homicides (FBI)	Homicides (CDC)	Counties w/ data	Sentences per county	Homicides per county (FBI)	Homicides per county (CDC)
Alabama	312	7,227	10,703	67	4.7	107.9	159.7
Arizona	211	9,430	10,425	16	13.2	589.4	651.6
Arkansas	72	4,811	5,291	75	1.0	64.1	70.5
California	692	65,161	60,775	58	11.9	1,123.5	1,047.8
Colorado	9	4,121	4,169	65	0.1	63.4	64.1
Connecticut	14	2,855	2,719	8	1.8	356.9	339.9
Delaware	49	816	964	3	16.3	272.0	321.3
Florida	655	4,887	27,118	67	9.8	72.9	404.7
Georgia	131	14,863	16,382	159	0.8	93.5	103.0
Idaho	16	786	720	44	0.4	17.9	16.4
Illinois	155	14,891	20,185	102	1.5	146.0	197.9
Indiana	39	8,199	8,768	92	0.4	89.1	95.3
Kansas	16	1,448	2,514	105	0.2	13.8	23.9
Kentucky	44	4,254	4,988	120	0.4	35.5	41.6
Louisiana	128	13,686	15,082	64	2.0	213.8	235.7
Maryland	27	11,917	10,955	24	1.1	496.5	456.5
Mississippi	102	4,509	7,634	82	1.2	55.0	93.1
Missouri	119	10,098	10,480	115	1.0	87.8	91.1
Montana	3	387	733	57	0.1	6.8	12.9
Nebraska	14	821	1,368	93	0.2	8.8	14.7
Nevada	108	4,175	4,006	17	6.4	245.6	235.6
New Hamp.	1	391	406	10	0.1	39.1	40.6
New Jersey	24	6,356	5,358	21	1.1	302.7	255.1
New Mexico	7	2,240	2,642	33	0.2	67.9	80.1

New York	7	7,795	7,263	62	0.1	125.7	117.1
N. Carolina	317	14,405	15,357	100	3.2	144.1	153.6
Ohio	249	12,389	12,986	88	2.8	140.8	147.6
Oklahoma	197	5,528	5,678	77	2.6	71.8	73.7
Oregon	51	2,467	2,573	36	1.4	68.5	71.5
Pennsylvania	267	17,029	16,698	67	4.0	254.2	249.2
S. Carolina	119	8,190	8,118	46	2.6	178.0	176.5
South Dakota	9	316	418	66	0.1	4.8	6.3
Tennessee	97	10,333	11,625	95	1.0	108.8	122.4
Texas	663	38,568	37,458	254	2.6	151.8	147.5
Utah	6	1,435	1,312	29	0.2	49.5	45.2
Virginia	101	10,781	10,036	133	0.8	81.1	75.5
Washington	24	5,184	5,072	39	0.6	132.9	130.1
Wyoming	1	344	378	23	0.0	15.0	16.4

Table A3: Top-25 Sentencing Counties, 1990-2016

Rank	County	State	Death Sentences	Homicides (FBI)	Homicides (CDC)	Total Pop.	Black Pop. Share (%)	Pop. density	Income per capita
1	Los Angeles	CA	213	28,232	26,742	9,532,157	10.3	2348	33,650
2	Harris	TX	182	10,274	10,250	3,573,512	19.3	2074	37,276
3	Maricopa	AZ	127	6,418	6,732	3,197,505	4.5	347	30,886
4	Philadelphia	PA	115	9,112	8,786	1,531,428	44.1	11352	28,373
5	Riverside	CA	92	2,793	2,430	1,746,005	6.6	242	25,780
6	Clark	NV	83	3,438	3,240	1,483,452	10.3	188	31,383
7	Duval	FL	73	494	2,713	796,646	28.2	1033	30,976
8	Cook	IL	71	13,748	15,414	5,250,489	26.3	5552	34,346
9	Oklahoma	OK	71	1,834	1,881	674,143	15.5	951	32,838
10	Dallas	TX	63	7,104	6,905	2,208,055	21.6	2515	36,504
11	Orange	CA	60	2,475	2,185	2,828,582	2.0	3582	39,840
12	Miami-Dade	FL	59	1,373	6,406	2,297,364	20.6	1188	29,861
13	Pima	AZ	53	1,779	1,863	863,974	3.6	94	27,014
14	Bexar	TX	51	3,512	3,452	1,484,127	7.7	1192	28,536
15	Tarrant	TX	51	2,694	2,707	1,537,242	13.8	1780	32,370

16	Jefferson	AL	49	2,326	3,207	659,628	39.8	593	33,946
17	Alameda	CA	48	3,697	3,536	1,438,101	15.3	1949	38,637
18	Broward	FL	46	401	1,968	1,617,298	23.0	1339	33,599
19	Shelby	TN	42	3,865	4,175	897,395	49.4	1186	33,069
20	Hillsborough	FL	42	354	1,791	1,065,030	15.8	1021	30,855
21	Hamilton	OH	39	1,524	1,647	833,613	24.1	2048	36,338
22	St. Louis	MO	39	904	944	1,006,886	19.9	1983	42,979
23	Pinellas	FL	38	197	1,231	909,418	9.5	3263	33,931
24	Tulsa	OK	36	1,311	1,301	566,157	10.9	993	36,261
25	San Bernardino	CA	36	4,054	3,797	1,801,537	9.5	90	24,445

II. ROBUSTNESS REGRESSIONS: ADDITIONAL HOMICIDE RATE LAGS

Table A4: 2-Year Lagged Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		**State-Year Fixed Effects**	
	FBI Data	**CDC Data**	**FBI Data**	**CDC Data**
Within-Effects				
Homicide rate at *t-2*	1.149*** (0.027)	1.214*** (0.034)	1.208*** (0.031)	1.238*** (0.031)
Percent black pop.	1.381** (0.156)	1.409** (0.171)	1.338* (0.165)	1.955*** (0.219)
Population density	4.477*** (1.434)	5.535*** (1.946)	8.035*** (2.745)	8.315*** (2.265)
Income per capita	1.368 (0.585)	1.172 (0.529)	0.734 (0.343)	0.872 (0.430)
Between-Effects				
Homicide rate at *t-2*	1.518*** (0.137)	1.475*** (0.125)	1.545*** (0.142)	1.436*** (0.062)
Percent black pop.	1.122** (0.042)	1.128** (0.042)	1.117** (0.041)	1.169*** (0.026)
Population density	2.220*** (0.089)	2.205*** (0.093)	2.230*** (0.087)	2.155*** (0.046)
Income per capita	1.017 (0.239)	1.085 (0.273)	0.997 (0.230)	0.678** (0.095)
Observations	62,790	60,350	62,790	60,350
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.

County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A5: 3-Year Lagged Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects FBI Data	CDC Data	State-Year Fixed Effects FBI Data	CDC Data
Within-Effects				
Homicide rate at *t-3*	1.051^{*} (0.024)	1.137^{***} (0.031)	1.092^{***} (0.027)	1.165^{***} (0.030)
Percent black pop.	1.411^{**} (0.159)	1.468^{**} (0.188)	1.371^{*} (0.168)	2.078^{***} (0.240)
Population density	4.397^{***} (1.405)	6.490^{***} (2.422)	8.038^{***} (2.724)	10.214^{***} (2.861)
Income per capita	1.364 (0.581)	1.198 (0.566)	0.752 (0.349)	0.877 (0.452)
Between-Effects				
Homicide rate at *t-3*	1.528^{***} (0.139)	1.477^{***} (0.126)	1.556^{***} (0.143)	1.485^{***} (0.065)
Percent black pop.	1.122^{**} (0.042)	1.135^{***} (0.043)	1.118^{**} (0.042)	1.171^{***} (0.027)
Population density	2.244^{***} (0.090)	2.225^{***} (0.095)	2.255^{***} (0.088)	2.104^{***} (0.045)
Income per capita	1.011 (0.239)	1.046 (0.267)	0.991 (0.230)	0.865 (0.123)
Observations	62,780	57,907	62,780	57,907
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A6: 4-Year Lagged Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	CDC Data	FBI Data	CDC Data
Within-Effects				
Homicide rate at *t-4*	1.083*** (0.024)	1.109*** (0.031)	1.113*** (0.028)	1.144*** (0.030)
Percent black pop.	1.403** (0.159)	1.604*** (0.222)	1.363* (0.167)	2.260*** (0.269)
Population density	4.469*** (1.430)	8.379*** (3.345)	8.019*** (2.710)	12.338*** (3.478)
Income per capita	1.328 (0.566)	1.339 (0.660)	0.738 (0.342)	0.887 (0.468)
Between-Effects				
Homicide rate at *t-4*	1.521*** (0.138)	1.482*** (0.127)	1.549*** (0.142)	1.484*** (0.067)
Percent black pop.	1.123** (0.042)	1.156*** (0.045)	1.119** (0.042)	1.188*** (0.029)
Population density	2.237*** (0.089)	2.216*** (0.097)	2.252*** (0.088)	2.096*** (0.047)
Income per capita	1.007 (0.237)	1.056 (0.275)	0.985 (0.228)	0.884 (0.129)
Observations	62,770	55,463	62,770	55,463
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A7: 5-Year Lagged Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	**CDC Data**	**FBI Data**	**CDC Data**
Within-Effects				
Homicide rate at *t-5*	1.093*** (0.024)	1.068* (0.030)	1.116*** (0.027)	1.101*** (0.028)
Percent black pop.	1.405** (0.159)	1.611*** (0.232)	1.368* (0.169)	2.287*** (0.273)
Population density	4.528*** (1.450)	9.255*** (3.945)	8.052*** (2.718)	12.852*** (3.660)
Income per capita	1.310 (0.557)	0.948 (0.479)	0.726 (0.336)	0.620 (0.315)
Between-Effects				
Homicide rate at *t-5*	1.525*** (0.138)	1.456*** (0.128)	1.553*** (0.143)	1.475*** (0.068)
Percent black pop.	1.122** (0.042)	1.154*** (0.046)	1.118** (0.041)	1.183*** (0.030)
Population density	2.235*** (0.089)	2.267*** (0.102)	2.252*** (0.087)	2.124*** (0.048)
Income per capita	1.006 (0.237)	0.966 (0.255)	0.983 (0.228)	0.871 (0.130)
Observations	62,760	53,018	62,760	53,018
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A8: 5-Year Moving Average Homicide Rate Negative Binomial Regressions

	State & Year Fixed-Effects		State-Year Fixed Effects	
	FBI Data	**CDC Data**	**FBI Data**	**CDC Data**
Within-Effects				
Homicide rate (5-yr moving avg.)	1.214*** (0.052)	1.536*** (0.101)	1.329*** (0.066)	1.469*** (0.095)
Percent black pop.	1.370** (0.153)	1.554** (0.214)	1.340* (0.163)	2.249*** (0.267)
Population density	4.907*** (1.609)	9.629*** (3.951)	8.187*** (2.832)	13.420*** (3.833)
Income per capita	1.311 (0.566)	1.354 (0.674)	0.743 (0.351)	0.906 (0.478)
Between-Effects				
Homicide rate (5-yr moving avg.)	1.530*** (0.137)	1.496*** (0.128)	1.555*** (0.141)	1.486*** (0.067)
Percent black pop.	1.119** (0.042)	1.151*** (0.046)	1.115** (0.041)	1.187*** (0.029)
Population density	2.234*** (0.089)	2.233*** (0.097)	2.248*** (0.087)	2.108*** (0.047)
Income per capita	1.029 (0.243)	1.068 (0.279)	1.015 (0.236)	0.900 (0.132)
Observations	62,770	55,448	62,770	55,448
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

III. Robustness Regressions: Poisson Results

Table A9: Baseline Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate	1.109^{***}	1.108^{***}	1.128^{***}	1.115^{***}
	(0.029)	(0.032)	(0.033)	(0.031)
Percent black pop.	1.801^{**}	1.757^{*}	1.958^{*}	1.904^{*}
	(0.399)	(0.394)	(0.534)	(0.523)
Population density	4.088^{***}	4.185^{***}	6.763^{***}	7.185^{***}
	(1.457)	(1.528)	(2.592)	(2.872)
Income per capita	2.390^{+}	2.458^{+}	1.183	1.194
	(1.233)	(1.273)	(0.710)	(0.719)
Between-Effects				
Homicide rate	1.546^{***}	1.524^{***}	1.546^{***}	1.524^{***}
	(0.155)	(0.151)	(0.155)	(0.150)
Percent black pop.	1.149^{**}	1.155^{***}	1.149^{**}	1.156^{**}
	(0.049)	(0.050)	(0.049)	(0.051)
Population density	2.107^{***}	2.078^{***}	2.104^{***}	2.078^{***}
	(0.107)	(0.107)	(0.108)	(0.108)
Income per capita	0.801	0.900	0.834	0.935
	(0.301)	(0.347)	(0.303)	(0.350)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A10: Race of Victim Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
White homicide rate	1.129*** (0.029)	1.125*** (0.030)	1.154*** (0.033)	1.133*** (0.029)
Black homicide rate	1.049 (0.033)	1.049 (0.033)	1.063+ (0.035)	1.051 (0.032)
Percent black pop.	1.806** (0.412)	1.804** (0.412)	1.942* (0.533)	1.955* (0.539)
Population density	3.943*** (1.383)	4.153*** (1.577)	6.331*** (2.279)	7.074*** (2.838)
Income per capita	2.364+ (1.199)	2.276 (1.158)	1.164 (0.665)	1.071 (0.624)
Between-Effects				
White homicide rate	2.792*** (0.451)	2.942*** (0.528)	2.788*** (0.448)	2.951*** (0.533)
Black homicide rate	0.810+ (0.088)	0.855 (0.083)	0.812+ (0.088)	0.853 (0.085)
Percent black pop.	1.460*** (0.123)	1.385*** (0.101)	1.459*** (0.122)	1.388*** (0.104)
Population density	2.069*** (0.092)	2.016*** (0.099)	2.063*** (0.094)	2.015*** (0.099)
Income per capita	1.004 (0.347)	1.420 (0.462)	1.046 (0.348)	1.478 (0.465)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A11: 1-Year Lagged Homicide Rate Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate at *t-1*	1.215***	1.287***	1.303***	1.294***
	(0.030)	(0.035)	(0.036)	(0.035)
Percent black pop.	1.755*	1.706*	1.895*	1.858*
	(0.391)	(0.389)	(0.522)	(0.517)
Population density	4.215***	4.408***	6.635***	7.260***
	(1.522)	(1.610)	(2.557)	(2.919)
Income per capita	2.288	2.410^{+}	1.112	1.127
	(1.186)	(1.241)	(0.673)	(0.679)
Between-Effects				
Homicide rate at *t-1*	1.541***	1.523***	1.542***	1.522***
	(0.154)	(0.150)	(0.154)	(0.150)
Percent black pop.	1.147**	1.152**	1.145**	1.153**
	(0.049)	(0.050)	(0.049)	(0.051)
Population density	2.089***	2.059***	2.079***	2.059***
	(0.105)	(0.105)	(0.106)	(0.106)
Income per capita	0.807	0.902	0.846	0.939
	(0.301)	(0.344)	(0.305)	(0.349)
Observations	62,800	62,794	62,800	62,794
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A12: 3-Year Moving Average Homicide Rate Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate (3-yr moving avg.)	1.178*** (0.041)	1.409*** (0.074)	1.307*** (0.056)	1.430*** (0.068)
Percent black pop.	1.790** (0.397)	1.804* (0.431)	1.924* (0.528)	2.003* (0.586)
Population density	4.246*** (1.548)	5.441*** (2.087)	6.880*** (2.665)	8.714*** (3.703)
Income per capita	2.358+ (1.221)	1.995 (1.030)	1.148 (0.693)	0.865 (0.525)
Between-Effects				
Homicide rate (3-yr moving avg.)	1.560*** (0.156)	1.489*** (0.147)	1.559*** (0.156)	1.493*** (0.148)
Percent black pop.	1.144** (0.048)	1.162*** (0.052)	1.142** (0.049)	1.161** (0.053)
Population density	2.105*** (0.105)	2.103*** (0.108)	2.096*** (0.107)	2.097*** (0.108)
Income per capita	0.814 (0.305)	0.864 (0.340)	0.855 (0.311)	0.937 (0.357)
Observations	62,790	60,342	62,790	60,342
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A13: Sum of All Prior Sentences Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Cumulative death sentences	45.580*** (9.875)	45.607*** (9.892)	56.172*** (11.511)	55.331*** (11.389)
Homicide rate	1.047* (0.022)	1.057* (0.029)	1.092*** (0.028)	1.050+ (0.028)
Percent black pop.	1.788*** (0.147)	1.831*** (0.152)	1.527*** (0.133)	1.586*** (0.142)
Population density	1.635 (0.615)	1.600 (0.590)	1.817* (0.521)	1.815* (0.515)
Income per capita	1.892 (0.789)	1.883 (0.783)	1.134 (0.462)	1.112 (0.461)
Between-Effects				
Cumulative death sentences	2.863*** (0.117)	2.807*** (0.116)	2.873*** (0.118)	2.805*** (0.117)
Homicide rate	0.779*** (0.048)	0.841** (0.051)	0.770*** (0.047)	0.841** (0.053)
Percent black pop.	1.056* (0.028)	1.033 (0.028)	1.060* (0.029)	1.035 (0.029)
Population density	1.116** (0.039)	1.125*** (0.039)	1.114** (0.040)	1.131*** (0.040)
Income per capita	0.932 (0.135)	0.924 (0.140)	0.904 (0.140)	0.898 (0.145)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A14: Share of Years with at Least 1 Death Sentence Poisson Regressions

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Sentencing share of years	77.033*** (13.038)	76.948*** (13.067)	96.200*** (13.482)	96.723*** (13.547)
Homicide rate	0.980 (0.025)	0.952 (0.032)	1.000 (0.030)	0.966 (0.030)
Percent black pop.	1.029 (0.159)	1.031 (0.157)	0.976 (0.153)	0.980 (0.153)
Population density	2.627* (1.105)	2.651* (1.125)	2.036* (0.685)	2.054* (0.694)
Income per capita	1.007 (0.458)	1.015 (0.461)	0.631 (0.300)	0.641 (0.304)
Between-Effects				
Sentencing share of years	3.812*** (0.247)	3.813*** (0.247)	3.877*** (0.241)	3.883*** (0.241)
Homicide rate	1.128 (0.087)	1.151+ (0.088)	1.160+ (0.090)	1.189* (0.091)
Percent black pop.	1.026 (0.034)	1.018 (0.034)	1.013 (0.032)	1.004 (0.032)
Population density	1.308*** (0.062)	1.299*** (0.061)	1.308*** (0.061)	1.298*** (0.060)
Income per capita	0.729 (0.182)	0.769 (0.198)	0.764 (0.186)	0.812 (0.204)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

IV. ROBUSTNESS REGRESSIONS: NON-TRANSFORMED VARIABLES

Table A15: Baseline Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate	0.879 (0.191)	0.564** (0.125)	0.851 (0.214)	0.845 (0.203)
Percent black pop.	1.082*** (0.018)	1.070*** (0.019)	1.108*** (0.011)	1.108*** (0.011)
Population density	1.002*** (0.000)	1.002** (0.001)	1.001*** (0.000)	1.001*** (0.000)
Income per capita	1.000+ (0.000)	1.000 (0.000)	1.000*** (0.000)	1.000*** (0.000)
Between-Effects				
Homicide rate	5.0e+06*** (1.2e+07)	8.6e+05*** (2.1e+06)	2.3e+04*** (1.6e+04)	4086.963*** (2159.680)
Percent black pop.	0.993 (0.004)	0.993 (0.005)	1.009*** (0.003)	1.008*** (0.002)
Population density	1.000+ (0.000)	1.000+ (0.000)	1.000 (0.000)	1.000** (0.000)
Income per capita	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A16: Race of Victim Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
White homicide rate	0.964	0.674^{*}	1.128	0.960
	(0.192)	(0.131)	(0.219)	(0.228)
Black homicide rate	0.728	0.358^{+}	0.482	0.611
	(0.436)	(0.192)	(0.269)	(0.327)
Percent black pop.	1.088^{***}	1.090^{***}	1.120^{***}	1.129^{***}
	(0.018)	(0.017)	(0.013)	(0.011)
Population density	1.002^{***}	1.001^{***}	1.001^{***}	1.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Income per capita	1.000^{+}	1.000	1.000^{***}	1.000^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Between-Effects				
White homicide rate	$1.2e+10^{***}$	$7.0e+11^{***}$	$7.4e+10^{***}$	$7.2e+10^{***}$
	(4.4e+10)	(2.8e+12)	(7.6e+10)	(7.2e+10)
Black homicide rate	8515.981^{*}	134.583	52.386^{***}	11.884^{***}
	(3.6e+04)	(440.957)	(34.516)	(6.159)
Percent black pop.	1.006	1.011	1.026^{***}	1.026^{***}
	(0.008)	(0.007)	(0.002)	(0.002)
Population density	1.000^{+}	1.000^{+}	1.000^{*}	1.000^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Income per capita	1.000^{***}	1.000^{***}	1.000^{***}	1.000^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A17: 1-Year Lagged Homicide Rate Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate at *t-1*	3.036***	3.503***	1.587*	1.935**
	(0.771)	(0.848)	(0.287)	(0.424)
Percent black pop.	1.081***	1.069***	1.108***	1.108***
	(0.018)	(0.019)	(0.011)	(0.011)
Population density	1.002***	1.002***	1.001***	1.001***
	(0.000)	(0.001)	(0.000)	(0.000)
Income per capita	1.000^{+}	1.000	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Between-Effects				
Homicide rate at *t-1*	5.0e+06***	8.5e+05***	1.9e+04***	3782.035***
	(1.3e+07)	(2.1e+06)	(1.2e+04)	(1993.006)
Percent black pop.	0.993	0.993	1.009***	1.009***
	(0.004)	(0.005)	(0.002)	(0.002)
Population density	1.000^{+}	1.000^{+}	1.000*	1.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Income per capita	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	62,800	62,794	62,800	62,794
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A18: 3-Year Moving Average Homicide Rate Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Homicide rate (3-yr moving avg.)	3.257^{*} (1.600)	5.656^{***} (2.626)	1.258 (0.582)	3.543^{**} (1.582)
Percent black pop.	1.080^{***} (0.018)	1.076^{***} (0.020)	1.107^{***} (0.011)	1.115^{***} (0.011)
Population density	1.002^{***} (0.000)	1.002^{***} (0.001)	1.001^{***} (0.000)	1.001^{***} (0.000)
Income per capita	1.000^{*} (0.000)	1.000^{+} (0.000)	1.000^{***} (0.000)	1.000^{***} (0.000)
Between-Effects				
Homicide rate (3-yr moving avg.)	$5.4e+06^{***}$ (1.3e+07)	$5.2e+05^{***}$ (1.2e+06)	$2.1e+04^{***}$ (1.5e+04)	2537.352^{***} (1336.510)
Percent black pop.	0.993 (0.004)	0.993 (0.005)	1.009^{***} (0.003)	1.009^{***} (0.002)
Population density	1.000^{+} (0.000)	1.000^{+} (0.000)	1.000^{+} (0.000)	1.000^{**} (0.000)
Income per capita	1.000^{***} (0.000)	1.000^{***} (0.000)	1.000^{***} (0.000)	1.000^{***} (0.000)
Observations	62,790	60,342	62,790	60,342
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 19: Sum of All Prior Sentences Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Cumulative death sentences	0.684 (74.160)	1.016^{+} (0.009)	0.570 (0.242)	0.647^{+} (0.152)
Homicide rate	1.345 (1933.537)	0.636^{+} (0.160)	0.022^{+} (0.043)	0.005*** (0.005)
Percent black pop.	0.943 (49.960)	1.067*** (0.016)	1.114*** (0.036)	1.115*** (0.026)
Population density	1.000 (0.174)	1.001 (0.001)	1.012^{+} (0.006)	1.011* (0.004)
Income per capita	1.000 (0.010)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)
Between-Effects				
Cumulative death sentences	2.163 (3402.987)	1.049*** (0.009)	1.530 (0.451)	1.374* (0.209)
Homicide rate	0.012 (24.835)	242.473*** (400.122)	0.000 (0.000)	0.000 (0.001)
Percent black pop.	1.003 (22.647)	0.996 (0.004)	1.011 (0.010)	1.012 (0.007)
Population density	1.000 (0.009)	1.000 (0.000)	0.998 (0.001)	0.999^{+} (0.001)
Income per capita	1.000 (0.018)	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	No	Yes	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
$^{+}$ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A20: Share of Years with at Least 1 Death Sentence
Negative Binomial Regressions (Non-Transformed Variables)

	State & Year FBI Data	Fixed-Effects CDC Data	State-Year FBI Data	Fixed Effects CDC Data
Within-Effects				
Sentencing share of years	1.175*** (0.014)	1.175*** (0.014)	1.188*** (0.014)	1.189*** (0.014)
Homicide rate	1.601+ (0.386)	0.951 (0.343)	1.852** (0.410)	0.952 (0.334)
Percent black pop.	0.987 (0.019)	0.987 (0.020)	0.957* (0.020)	0.956* (0.021)
Population density	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)
Income per capita	1.000** (0.000)	1.000** (0.000)	1.000** (0.000)	1.000** (0.000)
Between-Effects				
Sentencing share of years	1.032*** (0.004)	1.032*** (0.004)	1.029*** (0.004)	1.029*** (0.004)
Homicide rate	3.135 (4.738)	2.480 (3.526)	3.638 (5.309)	2.920 (4.009)
Percent black pop.	0.997 (0.003)	0.997 (0.003)	0.997 (0.003)	0.997 (0.003)
Population density	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)
Income per capita	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)	1.000*** (0.000)
Observations	62,810	62,803	62,810	62,803
State fixed-effects	Yes	Yes	No	No
Year fixed-effects	Yes	Yes	No	No
State-Year fixed-effects	No	No	Yes	Yes
Model converged	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

V. Robustness Regressions: Periodized Regression Results

Table A21: FBI Baseline Neg. Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate (log)	1.120***	1.225***	1.241***	1.327***	1.209**
	(0.038)	(0.041)	(0.050)	(0.065)	(0.079)
Percent black pop.	4.446***	7.743***	1.280	1.196	0.634**
	(1.146)	(2.193)	(0.229)	(0.205)	(0.106)
Population density	0.221*	0.120+	51.302***	34.568***	79.708***
	(0.160)	(0.152)	(47.612)	(20.701)	(44.600)
Income per capita	10.093**	31.968***	64.343***	10.037*	0.010***
	(8.453)	(30.898)	(66.056)	(10.040)	(0.010)
Observations	12,286	12,958	12,962	12,619	11,985
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A22: CDC Baseline Neg. Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate (log)	1.207***	1.237***	1.211***	1.280***	1.156*
	(0.040)	(0.042)	(0.047)	(0.057)	(0.073)
Percent black pop.	4.389***	7.811***	1.276	1.218	0.636**
	(1.109)	(2.233)	(0.233)	(0.208)	(0.106)
Population density	0.263+	0.113+	54.882***	35.810***	84.350***
	(0.193)	(0.137)	(51.173)	(21.562)	(47.415)
Income per capita	8.389*	34.979***	63.125***	10.757*	0.010***
	(7.011)	(33.509)	(65.326)	(10.712)	(0.010)
Observations	12,286	12,958	12,962	12,617	11,980
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A23: FBI Race of Victim Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
White homicide rate	1.121**	1.189***	1.215***	1.257***	1.175*
	(0.040)	(0.041)	(0.053)	(0.059)	(0.074)
Black homicide rate	1.088*	1.106*	1.069	1.233**	0.956
	(0.046)	(0.050)	(0.056)	(0.091)	(0.113)
Percent black pop.	4.444***	7.841***	1.273	1.131	0.646**
	(1.123)	(2.203)	(0.226)	(0.185)	(0.106)
Population density	0.220*	0.117+	50.543***	33.160***	85.619***
	(0.155)	(0.147)	(47.415)	(19.981)	(47.924)
Income per capita	10.685**	33.239***	64.039***	9.292*	0.009***
	(8.927)	(31.981)	(66.129)	(9.333)	(0.009)
Observations	12,286	12,958	12,962	12,619	11,985
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A24: CDC Race of Victim Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
White homicide rate	1.209***	1.249***	1.210***	1.214***	1.166*
	(0.041)	(0.040)	(0.047)	(0.057)	(0.072)
Black homicide rate	1.148**	1.025	1.108	1.304***	1.014
	(0.052)	(0.049)	(0.071)	(0.099)	(0.101)
Percent black pop.	4.402***	7.825***	1.266	1.148	0.634**
	(1.097)	(2.228)	(0.227)	(0.185)	(0.105)
Population density	0.278+	0.109+	52.170***	34.106***	82.737***
	(0.203)	(0.132)	(48.190)	(20.691)	(46.815)
Income per capita	8.710**	35.101***	60.404***	10.280*	0.010***
	(7.271)	(33.551)	(62.711)	(10.107)	(0.010)
Observations	12,286	12,958	12,962	12,617	11,980
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A25: FBI Sum of All Prior Sentences Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Sum of all prior sentences	65.184*** (22.644)	4065.160*** (1787.312)	2.2e+05*** (1.1e+05)	9.1e+04*** (5.3e+04)	2.0e+04*** (1.2e+04)
Homicide rate (log)	1.115*** (0.034)	1.154*** (0.040)	1.137* (0.071)	1.182* (0.088)	1.009 (0.094)
Percent black pop.	5.817*** (1.546)	5.080*** (1.511)	1.449 (0.495)	1.481 (0.503)	0.921 (0.316)
Population density	0.060*** (0.047)	0.059+ (0.086)	2.797 (2.917)	0.703 (0.523)	2.085 (1.357)
Income per capita	9.374** (7.388)	12.255* (12.651)	8.620+ (9.576)	11.544* (13.481)	0.873 (1.255)
Observations	12,286	12,958	12,962	12,619	11,985
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	No	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A26: CDC Sum of All Prior Sentences Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Sum of all prior sentences	65.302*** (22.952)	4221.424*** (1843.971)	2.3e+05*** (1.2e+05)	9.3e+04*** (5.4e+04)	2.0e+04*** (1.2e+04)
Homicide rate (log)	1.199*** (0.035)	1.253*** (0.046)	1.087 (0.069)	1.125 (0.083)	1.007 (0.097)
Percent black pop.	5.713*** (1.550)	5.004*** (1.470)	1.467 (0.502)	1.482 (0.505)	0.921 (0.316)
Population density	0.072*** (0.057)	0.060* (0.086)	2.955 (3.075)	0.712 (0.532)	2.086 (1.357)
Income per capita	7.360** (5.660)	12.468* (12.751)	8.771+ (9.750)	12.193* (14.259)	0.876 (1.260)
Observations	12,286	12,958	12,962	12,617	11,980
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	No	No	No

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table A27: FBI Share of Years with at Least 1 Death Sentence Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Share of years w/ 1+ sentences	124.711*** (29.216)	462.013*** (125.542)	1033.169*** (382.680)	195.495*** (67.604)	177.593*** (73.423)
Homicide rate (log)	1.154*** (0.041)	1.153*** (0.048)	1.283*** (0.078)	1.328*** (0.090)	1.210* (0.103)
Percent black pop.	4.400*** (0.976)	7.846*** (2.597)	1.606 (0.527)	1.362 (0.410)	0.738 (0.201)
Population density	0.093** (0.069)	0.204 (0.238)	14.918* (16.962)	9.042** (7.108)	15.521*** (11.244)
Income per capita	3.873 (3.243)	100.483*** (108.535)	42.694** (50.031)	6.560 (7.625)	0.017** (0.024)
Observations	12,286	12,958	12,962	12,619	11,985
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.00$

Table A28: CDC Share of Years with at Least 1 Death Sentence Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Share of years w/ 1+ sentences	123.254*** (28.841)	472.890*** (127.791)	1052.224*** (393.919)	201.536*** (69.610)	175.329*** (72.142)
Homicide rate (log)	1.214*** (0.055)	1.253*** (0.061)	1.220** (0.074)	1.307*** (0.087)	1.151+ (0.098)
Percent black pop.	4.385*** (0.974)	7.684*** (2.546)	1.587 (0.521)	1.365 (0.409)	0.735 (0.198)
Population density	0.114** (0.085)	0.203 (0.236)	18.062* (20.626)	9.504** (7.488)	16.590*** (11.954)
Income per capita	2.964 (2.474)	100.135*** (108.335)	40.211** (47.308)	6.906+ (7.991)	0.018** (0.024)
Observations	12,286	12,958	12,962	12,617	11,980
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A29: FBI 1-Year Lagged Homicide Rate Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate at *t-1*	1.266*** (0.047)	1.358*** (0.050)	1.501*** (0.063)	1.474*** (0.074)	1.193** (0.071)
Percent black pop.	4.308*** (1.235)	7.325*** (2.028)	1.288 (0.232)	1.192 (0.204)	0.633** (0.107)
Population density	0.216* (0.149)	0.154 (0.199)	47.749*** (45.570)	32.153*** (19.322)	81.311*** (46.390)
Income per capita	9.606** (8.108)	30.630*** (29.290)	53.129*** (54.377)	9.979* (9.930)	0.010*** (0.010)
Observations	12,281	12,958	12,962	12,619	11,980
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A30: CDC 1-Year Lagged Homicide Rate Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate at *t-1*	1.377*** (0.051)	1.402*** (0.059)	1.462*** (0.058)	1.414*** (0.075)	1.241*** (0.072)
Percent black pop.	4.271*** (1.203)	7.569*** (2.116)	1.278 (0.237)	1.221 (0.209)	0.637** (0.105)
Population density	0.304+ (0.218)	0.127+ (0.158)	46.239*** (42.570)	33.701*** (20.241)	81.061*** (45.862)
Income per capita	7.615* (6.482)	35.281*** (33.524)	55.722*** (57.518)	10.513* (10.461)	0.011*** (0.011)
Observations	12,281	12,958	12,962	12,617	11,976
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A31: FBI 3-Year Moving Average Homicide Rate Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate (3 yr. moving avg.)	1.285*** (0.075)	1.388*** (0.087)	1.618*** (0.116)	1.627*** (0.121)	1.178+ (0.107)
Percent black pop.	4.462*** (1.288)	7.786*** (2.232)	1.283 (0.240)	1.188 (0.214)	0.625** (0.105)
Population density	0.200* (0.140)	0.143 (0.187)	51.725*** (49.934)	37.207*** (22.859)	87.472*** (50.337)
Income per capita	10.900** (9.236)	31.694*** (30.677)	56.457*** (58.933)	9.735* (9.924)	0.009*** (0.009)
Observations	12,278	12,956	12,962	12,619	11,975
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table A32: CDC 3-Year Moving Average Homicide Rate Negative Binomial Regressions (Periodized Results)

	90-94	95-99	00-04	05-09	10-14
Homicide rate (3 yr. moving avg.)	1.578*** (0.135)	1.721*** (0.118)	1.628*** (0.100)	1.663*** (0.134)	1.341*** (0.119)
Percent black pop.	5.860*** (1.795)	8.102*** (2.202)	1.296 (0.252)	1.213 (0.210)	0.635** (0.105)
Population density	0.277 (0.228)	0.125 (0.159)	49.817*** (46.549)	38.342*** (23.546)	88.173*** (50.680)
Income per capita	4.548 (4.496)	36.693*** (35.683)	59.818*** (62.706)	10.658* (10.796)	0.009*** (0.009)
Observations	9,845	12,956	12,960	12,615	11,966
State fixed-effects	Yes	Yes	Yes	Yes	Yes
Year fixed-effects	Yes	Yes	Yes	Yes	Yes
Model converged	Yes	Yes	Yes	Yes	Yes

Regression coefficients expressed as factor changes.
County-clustered robust standard errors in parentheses.
+ $p<0.10$, * $p<0.05$, ** $p<0.01$, *** $p<0.001$