CRACKING DOWN ON SENTENCING DISPARITIES: THE FEDERAL SENTENCING ACT OF 2010'S IMPACT ON COCAINE OFFENDERS

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ABSTRACT

Crack cocaine's growth in the United States during the mid-1980s was accompanied by a suite of deterrence-driven criminal justice policies. One such policy was the Anti-Drug Abuse Act of 1986 (ADAA), The ADAA was the first federal criminal law to differentiate crack from other forms of cocaine and imposed a 100:1 sentencing ratio (Palamar, Davies, Ompad, Cleland & Weitzman, 2015). The ADAA's general imposition of longer prison sentences for all cocaine offenders had a disparate and devastating impact on communities of color. By the 2000s, African Americans had served almost as much time in prison for non-violent drug offenses as Whites had for violent offenses (Vagins & McCurdy, 2006). The Fair Sentencing Act of 2010 (FSA) attempted to remedy such disparities by, among other things, lowering the sentencing ratio for crack and powder cocaine from 100:1 to 18:1. Using secondary data from the United States Sentencing Commission, this study examines the FSA's impact on sentencing disparities of African American and White cocaine offenders. Results from difference-in-difference regression analyses indicate that the FSA not only lowered the average prison sentence length for all cocaine offenders, but also report an average of a 7 to 11 months reduction in prison sentences for crack cocaine offenders. Additionally, results indicate that the reduced effect on sentence lengths was stronger for African American than White cocaine offenders. This study aims to supply policymakers with research about unjust disparities in sentencing.

INTRODUCTION

Cocaine abuse is responsible for millions of emergency room visits and overdoses every year in the United States. Most prevalent among the wealthy elite in the 1970s, cocaine was once a symbol of affluence. Its popularity exploded when crack, a smokable rock form of cocaine, hit the Los Angeles drug scene in 1981 (Beaver, 2010). Crack was cheaper, sold in smaller quantities than powder cocaine, and was peddled in inner-city drug markets (Vagins & McCurdy, 2006). Consequently, crack became associated with communities of color. In 1985, major newspapers began differentiating powder from crack cocaine. By 1986, major news outlets declared crack an "epidemic" (Gross, 1985). Media reports disproportionately linked African Americans with crack in conjunction with violence (Cobbina, 2008). This fueled a false black threat narrative, and misleadingly portrayed crack as more dangerous than powder cocaine.

President Ronald Reagan harnessed media attention to garner congressional support for his most significant "War on Drugs" legislation, the Anti-Drug Abuse Act of 1986 (ADAA). The ADAA had unanimous House and Senate support, and created mandatory minimum sentences for federal drug offenders that varied by amount and type of drug involved. It was the first federal criminal law that differentiated crack from other forms of cocaine by imposing a 100:1 ratio for the sentencing of crack versus powder cocaine offenses (Palamar et al., 2015). Additionally, the ADAA created harsher sentencing guidelines for possession offenses of crack cocaine. Simple possession of powder cocaine was a misdemeanor and carried up to a one-year sentence, whereas simple possession of crack was a felony and carried a mandatory five-year sentence (Beaver, 2010).

Justification for the sentencing disparity stemmed from a number of myths associated with crack that have since been dispelled. Crack was believed to be more addictive than powder cocaine. However, a 1996 study in *The Journal of American Medicine* that the first to dispute this myth when it concluded that the effects of cocaine are similar regardless of form (Hatsukami & Fischman, 1996). Crack was also believed to cause violent physiological behavior. This myth was initially challenged by a 1988 study of homicides in New York City that found 85% of all deaths involving crack resulted not from the drug, but rather from the inherently violent illegal drug market (Goldstein, Brownstein, Ryan, & Bellucci, 1989). Perhaps the most persuasive myth was that crack, unlike powder cocaine, posed a unique danger to fetuses (i.e. "crack babies") (Vagins & McCurdy, 2006). However, Doctor Hallam Hurt and colleagues' (2011) decades-long study that followed 224 babies born to crack-addicted mothers in Philadelphia reported almost no differences between babies born to addicted-mothers versus non-addicted mothers. In a National Public Radio interview, Doctor Hurt stated that the issues identified resulted from poverty, not crack cocaine (Martin, 2013). A sentiment that has sense been reinforced.

Within years of the ADAA's passage, it became clear that the Act had a disparate impact on African Americans. In 1986, before the enactment of the ADAA, the "average federal drug sentence for African Americans was 11 percent higher than for Whites. Four years later, the average federal drug sentence for African Americans was 49 percent higher" (Vagins & McCurdy, 2006, p. ii). In 2004, the United States Sentencing Commission (USSC) argued that the crack-powder sentencing disparity contributed "more to the differences in average sentences between African American and White offenders than any possible effect of discrimination," and remedying the disparity "would better reduce the [sentencing] gap than any other single policy change" (USSC, 2014, n.p.).

Program Description

On August 3, 2010, President Barack Obama signed into law the Fair Sentencing Act of 2010 (FSA). The FSA reduced the sentencing ratio for crack and powder cocaine offenses from 100:1 to 18:1. Prior to the FSA, 5 grams of crack (or 500 grams of powder cocaine) carried a 5-year mandatory minimum, and 50 grams of crack (or 5,000 grams of powder cocaine) carried a 10-year mandatory minimum. After the FSA, 28 grams of crack (or 500 grams of powder cocaine) triggered a 5-year sentence, and 280 grams of crack (or 5,000 grams of powder cocaine) triggered a 10-year sentence (Grindler, 2010). In 2011, the USSC voted to retroactively apply the new guidelines to individuals sentenced before the law was enacted.

The primary goal of the FSA was to reduce the severity of crack cocaine sentences and to "reduce unjust disparities in sentencing for similar offenses involving different types of drugs" (Holder, 2014, n.p.). In turn, it was theorized that these changes would reduce sentencing disparities among African American and White cocaine offenders.

Research Question & Hypothesis

This study seeks to answer the following questions: What impact has the FSA had on sentencing disparities for crack and powder cocaine offenders? In particular, has the FSA achieved its goal of reducing the sentencing disparity between African American and White offenders? It is hypothesized that:

- *H1: After the passage of the FSA, crack cocaine offenders experienced a greater reduced effect on sentence length relative to powder cocaine offenders.*
- *H2: The reduced effect on sentence lengths was stronger for African Americans than Whites.*

An impact analysis of the FSA on sentencing disparities provides insight into how the application of sentencing practices, like mandatory minimums, harmfully and disproportionately impacts historically marginalized populations. Michelle Alexander (2012) argues in *The New Jim Crow* that laws like the ADAA perpetuate a system of racial control. The African American men in America's prisons are not exclusively impacted by mass incarceration, as their family and community members who rely on them feel the impact as well. To avoid the missteps of past politicians, who allowed myths and media to dictate justice policy, research like this study must be conducted to encourage the promotion of equitable and data-driven policies.

METHODS

Data & Sample

To determine the FSA's effect on sentence lengths of cocaine offenders, a natural experiment was conducted utilizing secondary datasets that captured information about two naturally-occurring sample groups from two years prior to (2008) and two years after (2012) the FSA's enactment. These datasets originated from the USSC Annual

Monitoring Reports of Federal Criminal Sentences, which include data on individual federal criminal cases received by the USSC that were assessed as constitutional.

The control group consists of federal drug offenders sentenced in both fiscal year 2008 ("FY08") and fiscal year 2012 ("FY12") where powder cocaine was involved without the presence of crack, and where the defendant's race was recorded as African American or White. The treatment group consists of federal drug offenders sentenced in both fiscal years where the primary or secondary drug involved was crack cocaine, and where the defendant's race was recorded as African American or White. The FY08 and FY12 datasets were appended to form a third dataset, with an added treatment dummy variable for fiscal year. Table 1 contains the variable definitions, and Table 2 contains descriptive statistics broken down by fiscal year.

Statistically significant differences of prison sentence length means in the control and treatment groups, by substance type and race, indicate that the gaps were not attributable to chance. In both FY08 and FY12, crack offenders received significantly longer sentences than powder cocaine offenders, and African American cocaine offenders received significantly longer sentences than their White counterparts. In FY08, on average, crack offenders received sentences that were 20 months longer than their powder cocaine counterparts, and African American cocaine offenders received sentences that were 43 months longer than their White counterparts. In FY12, while there was a reduction in the sentencing gap by substance type and race, crack offenders and African American cocaine offenders still received sentences that were significantly longer. Crack offenders, on average, received sentences that were eight months longer than powder cocaine offenders, and African American cocaine offenders received sentences that were 37 months longer than their White counterparts. Perhaps most jarring, however, is that even when comparing the sentences of offenders within a drug type and across fiscal years, African Americans received significantly longer prison sentences. Regardless of when the offense occurred and whether it involved crack or powder cocaine, on average African American offenders received sentences that were 30 months longer than their White offenders.

Additionally, Cohen's *d* effect size measure was calculated to quantify the size of difference between the control and treatment groups. A calculation performed on prison sentence lengths across samples, irrespective of substance type and powder, revealed a Cohen's *d* of .23. According to Cohen's (1969) guidelines this indicates a small, yet meaningful, effect size.

Measures

The dependent variable in this study is the offender's *ordered prison sentence* in months, which excludes months of alternative confinement. To maintain consistency across datasets, a number of adjustments were made to this variable: total prison sentences were recoded to zero if the sentence was probation, life sentences were recoded

to 470 months, and sentences above 480 months were adjusted to 480. While each of these modifications improve the measurement's reliability and validity, the recoding of sentences above 480 months prevented an effective life sentence, like 2880 months, from skewing the results even when the punishment was not explicitly a life sentence. Additionally, where no sentence length was identified, including even the possibility of probation, the subject was dropped from the analysis.

The independent variables are fiscal year, substance type, and an interaction variable of fiscal year by substance type. In the analysis, *fiscal year* is a dummy, binary variable that differentiates the fiscal year in which the case was sentenced to represent application of the FSA. *Substance type* is a dummy, binary variable that indicates whether the offense involved crack cocaine. To strengthen this measure's validity, any subject whose offense involved both powder and crack cocaine was coded as a crack offense. This default coding ensures a more accurate representation of the legal effects of a crack cocaine sentence. The addition of an *interaction term* to a regression model expands the understanding of relationships among model variables. The interaction term represents the combined effect of substance type (i.e. crack) and treatment application (i.e. offender sentenced under FSA). Inclusion of an interaction term improves the reliability and validity of the effectiveness measure (Horn & Lee, 2016). Statistical significance for this interaction variable would indicate that the effect of the treatment on sentence length is significantly different for crack cocaine offenders.

In addition to traditional demographic controls (i.e. race, age and gender), other variables that play a direct role in determining sentencing guideline enhancements were included to improve the study's reliability and validity. These include criminal history, involvement of a weapon, mandatory minimum application and offense type (USSC, 2016). A trial or plea variable was also added to control for outcomes explainable by a lower sentence offered as a result of an offered plea.

Study Design

This paper employs difference-in-differences (DD) regression analyses to investigate the impact of the FSA on sentence lengths for cocaine offenders. Crime outcomes were evaluated for all cocaine offenders, and then separated by White and African American offenders.

The DD method attempts to measure the effect of a treatment on an outcome variable by comparing a group of those receiving the treatment with a control group not receiving the treatment. Both groups are studied over the same time period which begins before the start of the treatment and ends after the treatment is completed. The difference in the outcome variable between the change in the treatment group, and the change in the control group, is the DD estimate and can be attributed to the treatment. This method subtracts out the effects of broader societal trends that have an influence on the outcome variable not related to the treatment. The DD method is fitting for this study as the

intended goal is to realize the FSA's effect on both crack and powder cocaine offenders over time while accounting for broader societal trends.

RESULTS

OLS Regressions

To determine the effect of substance type and race on ordered prison sentence lengths, ordinary least squares (OLS) regressions were used. Table 3 reports OLS estimates of the coefficients and standard errors of the variables included in the various model, and statistical significance is denoted by one or more asterisks. The r-squared computation was used to determine the percentage of variation in sentence length that can be explained by the model.

Models 1 and 2 report how substance type, when bundled with control variables, associate with sentence lengths in FY08 and FY12. For example, Model 1 shows that in FY08, crack offenders received slightly longer prison sentences than powder cocaine offenders–though it was not statistically significant, so it is possible that the relationship is due to chance. This is contrasted with Model 2, which shows that in FY12, crack cocaine offenders received slightly shorter prison sentences than powder cocaine offenders. Interestingly, when each model is stripped of just the race control, the direction of the coefficients mirror that of Models 1 and 2 but are generally more severe. For example, without a control for race, in crack cocaine offenders in Model 1 received four additional months in sentence length at a statistically significant level. However, when Models 1 and 2 are stripped of all control variables, both FY08 and FY12 crack cocaine offenders received even higher statistically significantly sentences than powder cocaine offenders. While these models provide insight, they only identify effects within rather than across fiscal years. Thus, to appropriately test the first hypothesis, an interaction term was included to perform DD analysis.

Models 3 and 4 report the findings of the DD models. Model 3 reports findings for the regression without controls, while Model 4 reports such findings with controls. In Model 3, every variable is statistically significant at the .001 level. This indicates strong support for rejecting the null hypothesis. However, as indicated by the small r-squared (2.1 percent), variation in sentence lengths are only weakly explained by Model 3. In comparison, the r-squared (39.7 percent) in Model 4 indicates a much stronger explanation of the variation in sentence lengths. This indicates that the control variables play a significant role in explaining the variation in sentence lengths. As was true in Model 3, Model 4's fiscal year and interaction variables are also statistically significant. This suggests that regardless of controls, the FSA played a critical role in reducing sentence lengths.

Finally, Models 5 and 6 report the findings of DD models by race. While both models report significant and negative findings by fiscal year, with Whites (-6.7 months) and African Americans (-11.2 months) on average receiving shorter sentences in FY12,

only the African American model reported a statistically significant finding for the interaction variable. These findings will be discussed further in the discussion section to follow. Other noteworthy differences include the significance levels of each model's control variables. While each control variable in Models 5 and 6 are significant, strength of that significance varies by variable and Model. In the African American model all control variables are strongly statistically significant, while in the White model age and offense type of possession were comparatively less significant.

DISCUSSION

Models 3 and 4 test the first hypothesis, that *crack cocaine offenders in FY12 experienced a greater reduced effect on sentence length relative to powder cocaine offenders*. The fact that both Models' fiscal year and interaction variables were statistically significant, and negative, indicates that the FSA had a greater reduced effect on sentence length relative to all cocaine offenders in FY08 and powder cocaine offenders in FY12. Specifically, Models 3 and 4 report lower treatment effects over time.

Models 5 and 6 test the second hypothesis, that *the reduced effect on sentence lengths was stronger for African Americans than Whites*. The fact that the African American model, when compared to the White model, reports a larger negative and statistically significant finding for the fiscal year variable, suggests support for the hypothesis. However, the strongest evidence in support of the hypothesis stems from the interaction term. Only the African American model reported a statistically significant finding for the interaction variable. This indicates that African American crack offenders in FY12 experienced a significant reduction in sentence length relative to African American crack cocaine offenders in FY08 and African American powder cocaine offenders in FY08 and FY12. The fact that only the African American model reported statistical significance for this variable suggests strong support for the hypothesis, that a reduced effect on sentence lengths was greater for African Americans than Whites.

Limitations

While secondary data analysis has many benefits, the use of secondary data presents potential risks to a study's internal validity. The reliability of secondary data analysis is dictated by the precision and accuracy of the primary data collection process (i.e. "garbage in, garbage out") (Boo & Froelicher, 2013). For example, the risk of measurement error and bias exists when data is collected and coded by researchers, as humans are fallible. For this study, these risks are low as the USSC is an independent government agency that is respected for its collection of high-quality data.

Another threat to internal validity stems from omitted variable bias. Omitted variable bias can occur when there exist unmeasured variables that confound the results. While the secondary datasets used for this study include nearly 15,000 variables, there are a number of variables that were not captured that likely play a role in determining

sentence length. For example, while there used to be a measure of defense counsel type, it was dropped from USSC's datasets starting in 2003 as the information was often unavailable. When such variables cannot be captured in the regression analysis, there exists a risk of omitted variable bias. Precautions were taken in this study to combat this risk through the inclusion of an interaction term. Given the ability of a DD to account for parallel trends, like general changes to drug sentences, the potential for omitted variable bias is lessened as DD analysis can account for influential societal trends.

Additionally, the scope of this study is limited. While the selection of FY08 and FY12 was appropriate, as they capture an equal time period before and after the FSA's implementation, this selection also limits the study's conclusions. Future research should consider using a time-series design to evaluate short-term trends to combat the potential for temporal bias. There are a number of other methodologies that could be used to test the second hypothesis; for example, the use of a three-way-interaction could allow for a test on the entire sample group instead of running two separate models of sample group subsets. While my methodological choices were suitable for this study and my skill level, as researchers we should strive to employ the best and most fitting methods possible. Thus, future research should explore these relationships using various research designs and methodological models.

Future Research

As discussed in the limitations section, there are a number of variables that could explain variation in sentence lengths which were not included in this study. One such variable is the location of sentencing by judicial district. In a recently published article, Pina-Sanchez and Grech (2018) examined court disparities in England and Wales and found that more severe sentencing occurred in courts located in neighborhoods with high proportions of Muslim residents. Given such findings, they concluded that sentencing disparities may, in part, be explained by non-legal contextual factors such as socioeconomic composition of an area. In the context of sentencing disparities for cocaine offenders, given existing demographic disparities, an exploration of non-legal contextual factors could provide policymakers valuable information. If, for example, there exists a disparity in sentencing across judicial districts, this may suggest the need for a process evaluation of prosecutorial decision-making or judicial application of mandatory minimums.

CONCLUSION

All criminal justice interventions should aim to be fair, just, and effective. Unjust differences undermine the judicial system's credibility. Thus, when disparities are identified, all attempts should be made to remedy them. While this paper's analysis suggests the FSA achieved its goal of reducing the sentencing disparity among cocaine offenders, the analysis also confirms historical trends that sentencing ratios

disproportionately disadvantage African Americans. As a sentencing ratio still exists, it is no surprise that sentencing disparities continue to exist as well. Given this, coupled with the fact that myths around exaggerated dangers of crack cocaine have been debunked, the existence of any sentencing ratio for cocaine offenses should be abolished. The goal of this study, and others like it, is to encourage policymakers to acknowledge the harms of sentencing ratios and to act by challenging the validity of sentencing ratios for drug offenses.

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APPENDIX

Table 1. Variable Definitions

Variable Name	Measurement/Definition
Ordered Prison Sentence	Continuous variable; total prison sentence ordered by month (470 for Life Sentences; 480 for sentences above 470 but not Life)
Substance Type: Cocaine	Dummy variable; 1 = Crack Cocaine and 0 = Powder Cocaine (if both involved, defaulted 1)
Race	Dummy variable; 1 = White/Caucasian and 0 = Black/African American
Age	Continuous variable; offender's age at time of offense
Gender	Dummy variable; 1 = Female and 0 = Male
Weapon Involvement	Dummy variable; 1 = Weapon Involved and 0 = No Weapon Involved
Criminal History	Dummy variable; 1 = yes, criminal history and 0 = no criminal history
Mandatory Minimum	Dummy variable; 1 = Mandatory Minimum Applied and 0 = Mandatory Minimum Not Applied
Offense Type	Dummy variables generated for each drug offense type (trafficking and possession)
Trial or Plea	Dummy variable; 1 = Settled by Trial, 0 = Settled by Plea
Location of Sentencing	Dummy variables generated for each judicial district in which the defendant was sentenced (12 total judicial circuits)
Fiscal Year	Dummy variable; 1 = 2012 and 0 = 2008

Table 2. Descriptive Statistics

Variable Name	Mean		S.D.	
	2008 (N=8,153)	2012 (N=5,908)	2008 (N=8,153)	2012 (N=5,908)
Ordered Prison Sentence (months)	106.156	87.186	86.650	77.000
Substance Type (Powder/Crack): Crack	.351	.544	.477	.498
Race: White	.207	.225	.405	.417
Age	32.671	34.660	8.884	9.297
Gender: Female	.094	.100	.292	.299
Weapon Involvement	.223	.183	.416	.387
Criminal History	.915	.911	.279	.284
Mandatory Minimum	.428	.357	.495	.479
Offense Type				
Trafficking and Manufacturing	.977	.970	.151	.171
Simple Possession	.010	.007	.098	.081
Trial or Plea: Trial	. 050	.043	.218	.204
Location of Sentencing*				
1st Circuit	.024	.022	.148	.148
2nd Circuit	.077	.097	.296	.300
3rd Circuit	.061	.057	.232	.232
4th Circuit	.209	.186	.407	.389
5th Circuit	.093	.102	.291	.303
6th Circuit	.137	.120	.344	.325
7th Circuit	.084	.072	.278	.256
8th Circuit	.087	.069	.281	.254
9th Circuit	.057	.118	.232	.322
10th Circuit	.022	.018	.145	.135
11th Circuit	.140	.127	.343	.333
DC Circuit	.013	.013	.114	.113

*The geographic boundaries of the United States District Courts are as follows: 1st Circuit – Maine, New Hampshire, Massachusetts, Rhode Island, Puerto Rico; 2nd Circuit – Vermont, New York, Connecticut; 3rd Circuit – Pennsylvania, New Jersey, Delaware; 4th Circuit – West Virginia, Virginia, North Carolina, Maryland, South Carolina, Virgin Islands; 5th Circuit – Texas, Louisiana, Mississippi; 6th Circuit – Michigan, Ohio, Kentucky, Tennessee; 7th Circuit – Wisconsin, Illinois, Indiana; 8th Circuit – North Dakota, South Dakota, Nebraska, Minnesota, Iowa, Missouri, Arkansas; 9th Circuit – Montana, Idaho, Washington, Oregon, Nevada, California, Arizona, Alaska, Hawaii, Guam; 10th Circuit – Wyoming, Utah, Colorado, Kansas, Oklahoma, New Mexico; 11th Circuit – Alabama, Georgia, and Florida; DC Circuit – Washington, D.C.

Table 3. Ordinary Least Squares (OLS) Regressions Model Results

	Model 1 (FY08)	Model 2 (FY12)	Model 3	Model 4	Model 5 (White)	Model 6 (Black)
Fiscal Year (FY)	-	-	-9.857*** (2.118)	-8.885*** (1.666)	-6.665** (2.096)	-11.243*** (2.198)
Substance Type (ST): Crack	2.297 (1.721)	-3.914* (1.671)	19.680*** (1.912)	2.722 (1.578)	1.980 (2.544)	1.700 (1.936)
Interaction (ST x FY)	-	-	-11.633*** (2.879)	-7.079* (2.264)	0.138 (4.333)	-6.186* (2.777)
Race: White	-15.952*** (2.019)	-11.111*** (2.098)	-	-13.610*** (1.463)	-	-
Age	0.588*** (.087)	0.176* (.176)	-	0.399*** (.061)	0.180* (.084)	0.526*** (.078)
Gender: Female	-28.547*** (2.693)	-27.610*** (2.702)	-	-28.139*** (1.927)	-19.700*** (2.258)	-34.258*** (2.710)
Weapon Involvement	35.425*** (1.852)	29.655*** (2.051)	-	33.191*** (1.380)	25.161*** (2.707)	34.604*** (1.578)
Criminal History	22.894*** (2.856)	18.870*** (2.959)	-	20.791*** (2.067)	10.674*** (2.216)	31.168*** (3.142)
Mandatory Minimum	62.093*** (1.625)	62.108*** (1.714)	-	62.085*** (1.188)	67.400*** (2.283)	60.915*** (1.364)
Offense Type: Trafficking	29.505*** (6.552)	24.044*** (5.167)	-	26.621*** (4.163)	22.400*** (5.961)	27.706*** (5.160)
Offense Type: Possession	-28.432** (10.114)	-36.402** (10.826)	-	-32.650*** (7.283)	-20.727* (9.620)	-41.429*** (9.391)
Trial/Plea: Trial	114.298*** (3.516)	112.531*** (3.876)	-	113.715*** (2.616)	98.346*** (5.668)	115.81*** (2.943)
Constant	1.689 (7.639)	15.390* (6.648)	93.377*** (1.541)	12.387* (5.134)	15.328* (6.936)	-0.784*** (6.595)
R^2	0.383	0.400	0.021	0.397	0.427	0.366
N	8,153	5,988	14,061	14,061	3,013	11,048

p<.05* p<.01 p<.001***