

**Racially Charged Police Enforcement Has Cost the U.S. Economy  
\$53 Billion to \$220 Billion in Lost Productivity**

Kurt W. Rotthoff<sup>1</sup>  
Seton Hall University

**Abstract**

There is a major difference in the drug arrest rate and incarceration rates between Black and White individuals. However, the drug use rate across the two groups is similar (and has been over time). This study estimates the lost productivity over time of people arrested on drug charges because they are Black. *Ceteris Paribus*, if those using the drugs were White, instead of Black, at the point of arrest and incarceration, what would have been their additional productivity levels over their lives? In this study I estimate this lost productivity to be \$53 billion to \$220 billion from 1980-2018 (in 2019-dollars), suggesting that the Lucas wedge is substantial for racial drug arrests.

**JEL:** I3, Z1, J3, K4, N3

**Keywords:** Racial Discrimination, Drug Arrests, Lucas Wedge

---

<sup>1</sup> Kurt Rotthoff can be reached at: Kurt.Rotthoff@shu.edu or Rotthoff@gmail.com, Seton Hall University. Thank you to Pete Groothuis, Abbi Cormier, and Meredith Dalrymple for helpful comments. Any mistakes are my own.

## **I. Introduction**

The human ability to invent and develop new technologies, and generally be productive, is amazing. And throughout most of our world's history, a large portion of the population have been restricted from developing and using these capabilities. For most of the world's history, women have been largely excluded from schooling and the workforce, an issue which is still relevant today. Given that the top producers, inventors, and Nobel Laureates are not easily predictable, the world has undoubtedly missed out on a lot of female Einsteins, Newtons, Steve Jobs, and many more. These issues are also true with racial and ethnic segregation. When your ability to produce and innovate is impacted by the color of your skin, your cultural background, religion, descent, or even sexual preference, then that impact can be felt by all. As we have missed out on our female Einsteins, we have also missed many Black Einsteins, Edisons, and Newtons.

As we have missed out on these productive people because we have turned down the opportunity to educate them and include their productive capabilities throughout the years, we also miss out on productivity when there is a segment of the population that is unnecessarily forced out of the labor market – or at least their ability to excel using their productivity capabilities is severely limited through the act of being arbitrarily arrested. That is, they could be productive members of society, but because of the color of their skin, they are pushed out of their most productive years through targeted arrests – an unintended consequence of the War on Drugs.

This study estimates the economic loss of a potential career from getting arrested (and potentially incarcerated) with a drug crime. The arrest not only hurts the individual at the time of arrest (and more so for incarceration), but it also has long(er) term impacts because they have to

“check the box” for the remainder of their lives (see Avery and Lu, 2020). That is, they have to declare that they have been arrested and/or incarcerated for a drug offense in the past when applying for a job (for the “check the box”, some ask if you have been arrested, whereas others only ask if you have been incarcerated – so both are analyzed in this study for an upper and lower bound estimate).

This has the potential to limit their job and economic prospects throughout their lives. The usage rates on drugs are similar for both Blacks and Whites (non-Hispanic Whites, throughout this study), with some evidence that Whites actually use at higher rates throughout most of the sample. Still, the arrest rate is not similar – the disproportionate impact of enforcement has a disproportionate effect on their productive capabilities. And as a second penalty of being Black, after arrest Blacks are more likely to be incarcerated than Whites. Think of this as a Lucas Wedge estimate on the lost productivity by disproportionately enforcing the War on Drugs differently on different racial groups. This study finds an estimate of lost productivity of this disproportionate enforcement since 1980 (through 2018) at a \$53 billion to \$220 billion loss to our economy over time (which is continuing to grow).

## **II. Drug Usage Rates**

People of all races use drugs. It is also well known that the usage rates across Whites and Blacks are not only similar but have been similar for the last 50 years in the United States (US). The “War on Drugs” began in 1971 under President Richard Nixon and has been continued throughout the years under both Republican and Democrat Presidents. The National Survey on Drug use and Health, which also began the year the War on Drugs began (1971), surveys over 70,000 people and finds that 37% of the people between the ages of 12 and 17 had used alcohol

or other drugs at least once in the last year.<sup>2</sup> With the use of the Child Trends data, we see that these rates have been changing over time.<sup>3</sup> Utilizing the data on self-reported use of illicit drugs, other than marijuana, over the past year among twelfth graders: it stood at 34 percent in 1981, falling to 15 percent in 1992, then rising to 22 percent in 2001, before falling to 17 percent around 2009. By 2017 this number declined to around 13 percent. And although White and Black usage rates have fluctuated somewhat over time, they have been relatively similar. For example in 2013 the National Survey on Drug use and Health shows that 9.5% of Whites had used illicit drugs in the last month, whereas 10.5% of Blacks had the same use; but when looking at the past year's usage in 2017 more Whites used (15%) than Blacks (13%).

In 1990, from the Sourcebook of Criminal Justice Statistics (1992), the percentage of Whites who ever used marijuana was 34.2% and Blacks were 31.7% (found in Trony, 1994).<sup>4</sup> When looking at cocaine, 11.7% of Whites had ever used, and 10.0% of Blacks had ever used. When looking at who had used in the last year, Blacks had a higher usage rate of both marijuana (11.2% vs. 10.1% for Whites) and cocaine (4% vs. 2.8% for Whites).

The Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics has usage rates for all illicit drugs for three years from 2015-2017.<sup>5</sup> The average usage rate of any illicit drug during this time was 10.9% for Whites and 12.7% for Blacks. They also look at marijuana usage from 2002-2017 and find that Blacks average usage was 8.6% over these years, and Whites used at an average of 7.2%.

As a sample, when looking at the National Household Survey on Drug Abuse (NHSDA, the 1999-2000 report), from the National Institute on Drug Abuse's "Drug Use Among

---

<sup>2</sup> <https://nsduhweb.rti.org/respweb/homepage.cfm>

<sup>3</sup> <https://www.childtrends.org/indicators/illicit-drug-use-2>

<sup>4</sup> Sourcebook of Criminal Justice Statistics (1992) Bureau of Justice Statistics, tables 3.103, 3.104, 3.105

<sup>5</sup> [https://www.cdc.gov/nchs/hs/content2018.htm#Table\\_020](https://www.cdc.gov/nchs/hs/content2018.htm#Table_020)

Racial/Ethnic Minorities (Revised)” show that the illegal drug use for White individuals is an estimated 6.4 percent.<sup>6</sup> Which they argue is no different than corresponding values for Black individuals. This study also looks at usage rates over time (in their Table 18), finding that use rates in 12<sup>th</sup>-grade students from 1980 to 2000 show a clear pattern of more Whites using than Blacks (Table 1).

Table 1:	1980	1985	1990	1995	2000
Marijuana use by 12th graders					
White	51.2	41.6	31.6	34.2	38.2
Black	37.9	33.4	13.7	26.8	30
Cocaine use by 12th graders					
White	12.8	13	6.3	4	6.2
Black	5.2	5.3	1.7	1	1

The National Household Survey on Drug Abuse (NHSDA) was a survey to the noninstitutionalized population of the US aged 12 and older done prior to 2002. The survey is considered the primary use of statistical information on the use of illegal drugs. The survey collects data through questionnaires to a representative sample of the population through face-to-face interviews. NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). The SAMHSA survey was the survey that was continued after 2002. When looking at an older age group, over 26, Whites continue to use at a higher or equal rate over time (a sample of the years are listed in Table 2).

Table 2: Marijuana use over the age of 26 (source SAMHSA)

	1979	1982	1985	1988	1991	1995	1996	1999	2001	2006	2007	2013
White	28	29.3	31.1	32	32	33.5	34.4	37.1	40.1	43.9	45.2	48.5
Black	28	28.2	26.6	26.8	28.7	28.2	29.6	32.1	33.1	37.6	38	42.4

However, when looking at college usage rates, Whites tend to use at a higher rate. McCabe et al. (2007), using data from 4,580 undergraduate students at a Midwestern research

<sup>6</sup> [https://archives.drugabuse.gov/sites/default/files/minorities03\\_1.pdf](https://archives.drugabuse.gov/sites/default/files/minorities03_1.pdf)

university, found that White students were more likely to report drug abuse than Black students (and males more than females). This research is in line with much of the past research showing White students have higher rates of illicit drug use than Black and Asian college students including marijuana (Bell et al., 1997; Meilman et al., 1995; Mohler-Kuo et al., 2003), ecstasy (Boyd et al., 2003; Strote et al., 2002), and several classes of prescription drugs (McCabe, 2005; McCabe et al., 2005a, 2005b).

### **III. Arrest and Incarceration Rates**

Although the results consistently show that the usage rates of Whites are similar to, or above, the usage rates of Blacks, the arrest rates are clearly not. In Alexander's (2010) book "The New Jim Crow: Mass Incarceration in the Age of Colorblindness" she argues that the intent of the War on Drugs was to enable Jim Crow laws to be enforced after the Jim Crow laws stating "separate but equal" were deemed illegal. Although this intent can be debated (in a different study as it is not the focus here), the outcome cannot be. Black users are roughly equal to White users, but arrest rates are vastly different. The number of incarcerated people in the US has ballooned from 500,000 people in 1980 to over 2 million people today (with another 4.5 million on probation or parole). So, although the US has 5% of the world population, it has 21% of the world's prison population.<sup>7</sup> Meanwhile, this is occurring while the property crimes, larceny, burglary, and motor vehicle theft has fallen drastically since the 1990s.<sup>8</sup>

With this information, the racial makeup of this population is important. The percentage of the US population that is Black is 32%, although they made up 56% of all incarcerated people in 2015, which means that Black citizens in the US are incarcerated at a rate around five times

---

<sup>7</sup> <https://www.naacp.org/criminal-justice-fact-sheet/>. Although this could be driven by longer sentences, the number of arrests has been rising over this time as well.

<sup>8</sup> Bureau of Justice Statistics

higher than their White counterparts. Statistically speaking, given the usage and arrest rates, it is estimated that if Blacks were arrested at the same rate as their White counterparts, prison and jail populations would fall by 40%. The idea of this last statistic is what can be used to estimate a racial productivity loss given unequal enforcement of the stated drug wars – what economists call the Lucas Wedge, a measure of lost productivity from this disproportionately enforced law.

The intent is unknown, but the outcome is clear. Racially charged outcomes are not new in the US, but is a form of implicit discrimination (as opposed to the previously legal explicit discrimination) – since it is up to the enforcer on how, and to who, they should apply a given law. This study focuses on the impact of this arrest discrimination, done by comparing a hypothetical setup: *Ceteris Paribus*, if those using the drugs were White, instead of Black, at the point of arrest, what would have been their measured productivity over their lifetimes relative to being Black at the time of arrest? Given that Whites use at or at a higher rates than Blacks, a conservative estimate would be that they use at the same rate. But Black people are roughly 2.5-3 times as likely to get arrested for drug crimes and four times more likely to be incarcerated.<sup>9</sup> I analyze this by looking at the arrest per 100,000 residents, then looking at the incarceration rates across the different racial groups.

It could also be argued that the arrest rates of Blacks are higher than Whites because there is more policing and enforcement in lower income areas (which are most likely to have higher Black populations), and arguably this is acceptable because this may be where more drug transactions occur. However, given that the War on Drugs is designed to reduce (eliminate?) the use of drugs, and the usage rate is equal across races, we would expect the arrest rate and

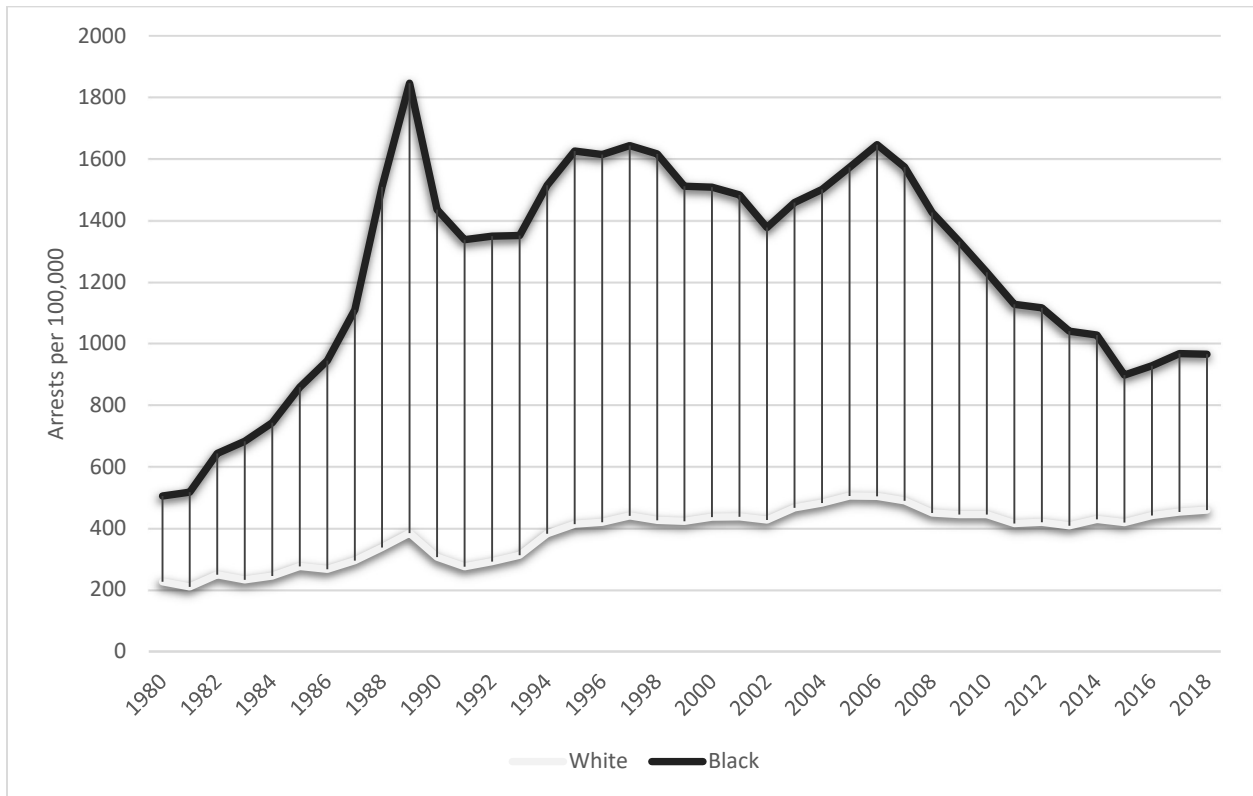
---

<sup>9</sup> <https://www.naacp.org/criminal-justice-fact-sheet/> and [https://www.hamiltonproject.org/charts/rates\\_of\\_drug\\_use\\_and\\_sales\\_by\\_race\\_rates\\_of\\_drug\\_related\\_criminal\\_justice](https://www.hamiltonproject.org/charts/rates_of_drug_use_and_sales_by_race_rates_of_drug_related_criminal_justice)

enforcement to be equal across races as well. The argument of extra policing in areas that are predominantly Black does not refute any aspect of the racial injustice found in this study.

Figure 1: Trends in Arrest Rates by Race for Drug Abuse Violations

(rates per 100,000, all ages)<sup>10</sup>



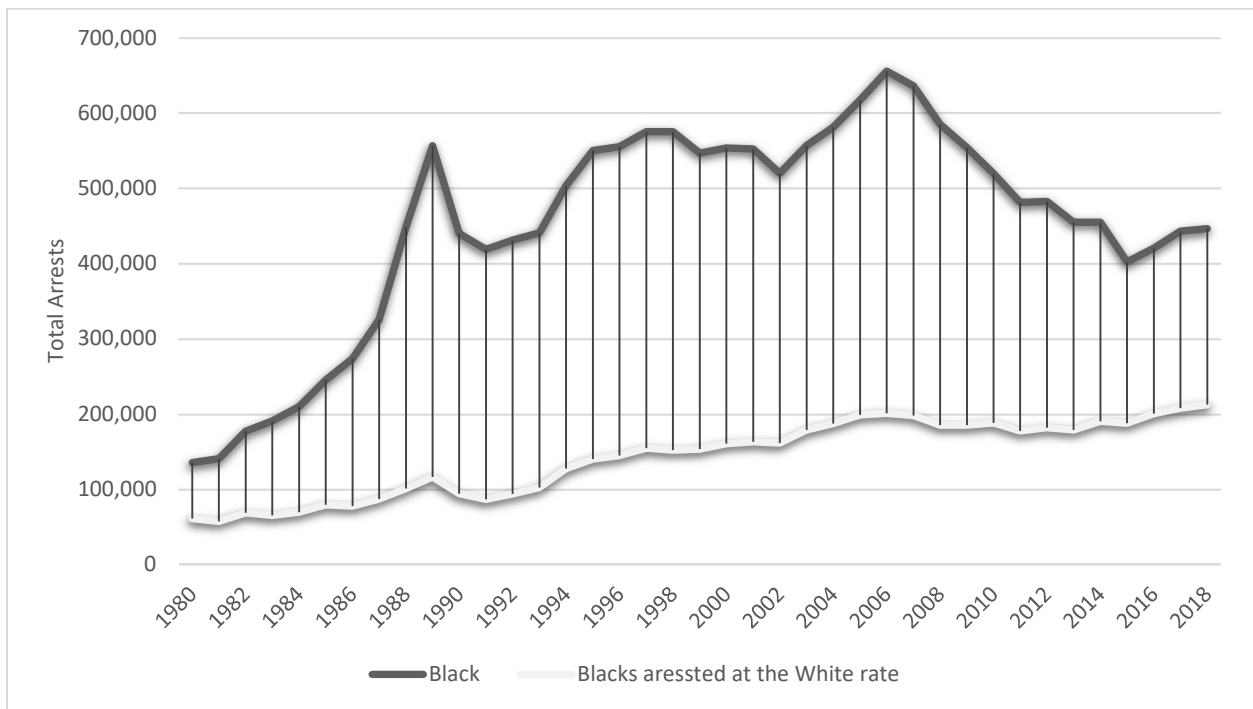
The arrest rates of Whites and Blacks over time, per 100,000 residents to control for population differences across the groups and over time, are presented in Figure 1 (supported in Table 1A, in the appendix). There is a difference in the arrest rates of Whites and Blacks from 1980-2018 (data from the US Department of Justice’s Office of Juvenile Justice and

<sup>10</sup> Official Citation: OJJDP Statistical Briefing Book. Trends in arrest rates by race for Drug abuse violations (rates are per 100,000 in age group). Available: [https://www.ojjdp.gov/ojstatbb/crime/ucr\\_trend.asp?table\\_in=2](https://www.ojjdp.gov/ojstatbb/crime/ucr_trend.asp?table_in=2). Released on October 31, 2019. Data source: Arrest estimates for 1980-2014 developed by the Bureau of Justice Statistics and disseminated through 'Arrest Data Analysis Tool.' Online. Available from the BJS website. Arrest estimates for 2015 through 2018 developed by the National Center for Juvenile Justice based on data published in the FBI's Crime in the United States reports. These are preliminary estimates that will be updated upon release of final estimates on the Bureau of Justice Statistics' Arrest Data Analysis Tool.



Delinquency Prevention). As you can see, these arrests are for drug violations only, and Blacks are arrested at much higher rates than Whites. The lowest ratio of Black-to-White arrests is 2.1 in 2016, with the highest ratio of 4.8 in 1989. This means that in the late 80s, Blacks were almost five times more likely to be arrested for drug violations than Whites. But remember that the usage rates were not the same during this time. Whites had higher usage rates, but lower arrest rates (they were using 10 to 20 percent more over the age of 26, and 130 percent higher for 12<sup>th</sup> graders), meaning that the arrests per 100,000 underestimates the impact of these differences.

Figure 2: Total Arrests of Blacks, and What it Would be if They Were White



The application of this information is to ask the question: What would the arrest rate look like if someone who is Black was White at the time of the arrest? Thus, in Figure 2 I apply the arrest rate, per 100,000 of Whites (by year), to the Black individuals that were arrested. As you can see, the numbers of arrests that would have occurred if these people were arrested at the White rate, rather than the Black rate, is substantial. To put this into numbers, this means there

would be over 12 million fewer drug arrests over these 39 years, averaging 307,700 fewer arrests per year.

There are just under seven million people currently under correctional control (Smith and Simon, 2020). In supporting evidence that the War on Drugs leads to targeted arrests made on Black individuals (as stated in Alexander, 2010), Tonry (1994) shows, in his Figure 2-5, that the arrest rates per 100,000 for Whites and Blacks were nearly identical until early 1980. This upholds Alexander's statement that after Jim Crow laws were deemed illegal, the War on Drugs allowed targeted racial enforcement of drug laws to be disproportionately enforced directly on the Black community. These arrests not only have an impact at the time of arrest but can have lasting effects – specifically on wage rates and employment opportunities.

There is a movement to “Ban-the-Box” (Avery and Lu, 2020), which means that you would no longer ask if a person has been arrested or incarcerated, instead you would focus on a candidate's qualifications rather than holding a stigma for their conviction or arrest record. Thus, in the next section I analyze the incarceration rate differences across groups, as it is unclear if the major life-long penalty comes at the point of arrest, or only if incarcerated.

### *Incarceration Rates*

There is a difference in the incarceration rate and the rate of incarceration. Most studies use the incarceration rate, which is composed of the current prison population divided by the population. However, this has creates a big issue in measuring the rate at which a certain sub-group is incarcerated at: because Blacks who are arrested and incarcerated are given longer sentences than their White counterparts (see Pestorsilia, 1983 and Arvanites and Asher, 1998).<sup>11</sup> As such, if you measure the incarceration rate at any given point in time, these longer sentences

---

<sup>11</sup> This is not addressed in this study, but relevant for future research.

will bias the rate of incarceration up (as it is a snapshot of the incarcerated population at that period of time). What we want to analyze is the rate at which someone arrested ends up in jail, so we need the rate of incarceration.

The incarceration rate, and the predictors of this rate, are addressed in many studies (for example see Campbell et al., 2015, and the papers cited within). The rate of incarceration is much more difficult to disentangle from this line of research (while some studies talk about these as if they are interchangeable). Within this research I do my best to disentangle those, starting with the findings in Huizinga and Elliott (1987), who find that the rate of incarceration of Black youth is two to four times that of White youth. Further pointing out that this disproportionate number of minority youth that are incarcerated cannot be explained by the differences in delinquent behavior (confirming the updated analysis in this paper of similar usage rates). Krisberg et al. (1987) claim that the minority youth are being incarcerated at a rate of three to four times that of Whites.

More recently Pestorsilia (1983) and Arvanites and Asher (1998) say that Black youth are more likely to go to prison, to get longer sentences, and to end up serving longer terms than their White counterparts. In a 2007 study, Mauer and King (2007) show that Blacks are incarcerated at nearly six (5.6) times the rate of Whites (but this is the incarceration rate, not the rate of incarceration). While Rovner (2021) finds that the modern incarceration rate for Blacks is still approximately four times that of Whites.

### *Locational Differences*

It is known that different cities, with different racial makeups, have different arrest and incarceration rates across races. The U.S. Department of Justice's Data Analysis Tool allows data on arrest rates by race to be pulled on the macro-level (for the US) but does not show the trend

in racial arrest rates at the local level (at the local level is analyzes a count, it shows the arrest rate per 100,000, but does not split the data by race over time).

However, a report from The Sentencing Project (Rovner, 2021) analyzes the youth incarceration rate by race by state. They find that Black youth are four times more likely to be detained or committed to a juvenile facility than their White counterparts. This is down from an all-time high of five times in 2015. This study also shows a trend that most states are seeing a decrease in racial disparity over time, but some states are getting worse (with South Carolina having the largest increase in racial disparity between 2015 and 2019). Nationally, they find that the Black youth placement was 315 per 100,000, whereas their white counterparts only had a youth placement of 72 per 100,000.

Rovner (2021) found that the worst states had a committed rate at more than 10 times higher for Black than White youth. The worst states for racial disparity were New Jersey (Blacks are 17.5 times more likely to be detained or committed to a juvenile facility than their White counterparts), Wisconsin (11.3), District of Columbia (11.1), and Connecticut (10.6). There were two states where the where the racial disparity was less than three times (and notable no states where they were even or worse for Whites than Blacks); Indiana at 2.2 times and Alabama at 2.8 times.<sup>12</sup>

#### **IV. Employment Impacts of Arrest and Incarceration**

Although having an arrest (and more-so if incarcerated) record undoubtedly has an impact on someone's entire life, the consensus in the literature on the salary impacts on these individuals is that there is a significant impact; but it is temporary. Having a criminal record decreases the chances of a callback or job offer and decreases the wage rate (and the total income

---

<sup>12</sup> Further research into state and city breakdowns of this type of research are encouraged.

for a year) for a period of time after the arrest. Additionally, it is argued that the negative impact of a criminal record is larger for Black applicants.

Using the National Longitudinal Survey of youth, with quantile regressions, Brown (2019) estimates the incarceration penalties across the wage and income distribution along with the long-term effects. These estimates on mean wages, income, and labor supply align with the previous findings in the literature that wages are lowered as an impact of these arrests (for a good summary of the literature, see Brown, Table 1, page 62). The estimates in Brown are particularly useful because the study is done by matching individual characteristics to control for the fact that the average prisoner is not the average American. People in jails and prisons are typically disadvantaged in their labor market outcomes: they are less educated on average, less likely to be employed, and earn less than those who are never incarcerated. Thus, following Becker's (1968) theory of crime, we would expect the opportunity cost of crime to decrease when it is increasingly difficult to find (legitimate) gainful work. In addition, we expect the crime rates of these individuals to be higher on average than those with higher education rates and are more likely to be employed. Also, being incarcerated itself decreases the cost of future crime (Yang, 2017, Ramakers et al., 2012, and Western, 2002).

The wage penalty ranges from 0-22% (Raphael, 2007), 3-6% (Pettit and Lyons, 2007), and 5-7% (Pettit and Lyons, 2009), to other studies in the range of 10-30% (Waldfogel, 1994; Grogger, 1995; Needels, 1996; Kling, 1999; and Lyons and Pettit, 2011), with a few that go into the 30-40% penalty range (Mueller-Smith, 2015 and Bhuller et al., 2016). Being that the average person arrested for drug crimes is on the lower end of the income distribution, Brown (2019) employs quantile regression to find the specific results for that particular group, but also to test

whether the wage and income effect of incarceration dissipate over time (and how it is different across different levels of the income distribution).

Brown (2019) finds that those in the low-skilled, low education group are not disproportionately penalized with lower wages but do face increased difficulties accruing income, which could be driven by a decreased labor supply. Also, for those that can remain out of prison, these effects diminish after several years (although most research links incarceration to labor market difficulty after release, see Holzer, 2009; Muller-Smith 2015; Visher et al. 2008; and Western et al. 2001).

In his study, Brown (2019) match respondents that are incarcerated with those at risk of being incarcerated to match groups and estimate wage and income differences. He matches the Armed Forces Qualification Test (AFQT) and controls for sex, race, age, age-squared, years of education, region of the country, urban vs. MSA residence, union status, time at job, if they were a public-sector employee, marital status, number of household members, school enrollment status, and controls for the industry of employment. The incarcerated group is disproportionately Black and male, which mirrors the trends in the US and is the focus of this study. With this, and across the panel of wage rates, the effect is significant, negative, and ranges from 17-24% when controlling for individual-level fixed effects. This impact dissipates over time, falling to 3-6% in three and five years after release.

Brown (2019) also does not separate out the incarceration rate of Blacks and Whites, although it is known that the incarceration rate for Blacks is higher than it is for Whites. Thus, using the estimates from Brown in this study will give estimates of the overall loss in productivity as the incarceration rate and penalty for incarceration are both higher for Blacks on average (although I cannot, unfortunately, discern how much higher for this study).

The number of weeks worked is also impacted by incarceration. After incarceration, the probability of being employed is reduced significantly, and they work fewer weeks (Freeman, 1991a 1991b; Waldfogel 1994; Western, 2006; and Grogger, 1992, 1995). In Brown (2019) these estimates correspond to a decrease of 16 weeks employed during the year of release, decreasing to three weeks by the second year, and find some evidence they spend slightly more time out of the labor force by five years out (relative to those not incarcerated). Brown finds that there are large incarceration penalties at the lowest income levels when looking at the annual incomes of these individuals.

## **V. Estimates of Lost Productivity**

To estimate the impact of the racial disparities over time I separate it into two different impact – impacts on arrests and impacts on incarcerations, as checking the box can potentially have career impacts on either outcome. I estimate the lost wages that have occurred to within the Black population from 1980-2018 as if they were arrested and/or incarcerated at the same rate of the White population. That is, if Blacks were arrested at the same rate, per 100,000, as Whites, how much more income would have been generated within this group? Then I do this again as if Blacks were incarcerated at the same rate as Whites.

To do this, I used the weekly wage rate for Black individuals at the 20<sup>th</sup> percentile in the US for each year in the sample, in 2019-dollars (from the Economic Policy Institute’s State of Working America Data Library).<sup>13</sup> Their total yearly incomes are then reduced in two ways: first by the decrease in the wage rates earned, secondly by the number of weeks worked per year – both of these effects diminish over time, which is also taken into account.

---

<sup>13</sup> <https://www.epi.org/data/>

Using estimates from Brown (2019), I account for a wage penalty in each of the first five years after arrest or incarceration (using a smooth, but conservative curve on the depreciating impacts). Specifically, I use a wage penalty of 20% in the first year, 10% in the second year, 5% in the third year, 4% in the fourth year, and 3% in the fifth year. Although some studies have estimated larger or smaller estimates, this gives a smooth non-linear impact of wages over the years that is diminishing over time. Additionally, I account for a penalty in the number of weeks worked. I reduce the number of weeks out of the labor force each year after the release. In the first year, there is a 16-week penalty, with a three-week penalty in the second year, two-weeks in the third, and one-week in both the fourth and fifth years. These estimates are made off an expected 50-week work year, and for years where the five years after arrest are not available, I use the salary data from the last year available (i.e., there is no weekly wage data for the years after a 2018 arrest, so all subsequent years continue to use the 2018 wage data). I also assume this is the impact of checking the box, which could impact people who have to admit they were arrested, but on some applications this only impacts them if they are incarcerated – thus the wage impact is that they had to check the box, with it being unclear if this impact occurs only for incarcerations or simply if they are arrested at some point.

These estimates for each year are then multiplied by the number of additional arrests or incarcerations in this population simply because they are Black (additional arrests and estimates are in the appendix, Tables 2A and 3A, with incarcerations and estimates also in the appendix in Tables 4A and 5A). That is, this gives the total penalty in this racial group for being a Black user of drugs rather than a White user of drugs – given they have similar usage rates, but drastically different arrest and incarceration rates.



This will estimate a form of the Lucas Wedge of lost productivity in our economy because of racially charge arrest practices in the US. The total estimate for arrests is \$195 billion from 1980-2020, with a peak year of almost \$7.7 billion in 2006. Additionally, if we use the 20<sup>th</sup> percentile wage of the White worker, rather than the Black worker (an additional penalty as a racial disparity in wages), this estimate increases to \$220 billion.<sup>14</sup>

While most studies give the current incarceration rate, or the current prison population arrested on a drug offense, by percentage, there is little publicly available information on the percentage of those arrested for drug offenses that end up incarcerated. Through my readings of these studies (for example see Pew 2018) it looks like a reasonable rate of incarceration for Whites is five percent, with the Black rate of incarceration four times that (20%). Thus, if the only wage impacts are on those that are incarcerated, and not just arrested, then the racial impact is the difference in Black users arrested at the Black rate and incarcerated at the Black rate relative to if they were arrested at the White rate and incarcerated at the White rate (controlling for the double penalty that exists for arrested drug users). When this is done estimating only those incarcerated the impact at the Black wage rate is almost \$53 billion, which goes to \$60 billion if this was estimated at the White wage rate (a third penalty on being Black). Thus, these estimates range from \$53 billion to \$220 billion in lost productivity from racially charged drug arrests.<sup>15</sup>

## **VI. Conclusion**

The evidence shows that the White and Black population in the US use illegal drugs at the same rate (with some evidence that Whites use at a higher rate). However, there is also

---

<sup>14</sup> When using different income ranges, using the Black wage at the 10<sup>th</sup> percentile this becomes \$167 billion. And at the median Black income this becomes \$293 billion.

<sup>15</sup> When using different income ranges for Black workers, at the 10<sup>th</sup> percentile this becomes \$45 billion, and \$79 billion at the median Black income.

evidence that Blacks are arrested at a much higher rate than Whites, with a peak of Blacks being arrested at nearly five times the rate of White (per 100,000 residents). Additionally, the Black incarceration rate is around four times as high as the incarceration rate of Whites. This study estimates the lost productivity of these Black users being arrested and incarcerated at significantly higher rates than they would if they were White. This productivity loss is a form of a Lucas Wedge on lost productivity of a certain group in the economy, rather than an economy on the whole.

When looking at the lost wage impact in the economy because of racially motivated arrests, I estimate that the US have lost between an additional \$53 billion and \$220 billion from 1980-2018 (depending on if the check the box penalty only impacts those incarcerated, or it impacts anyone who has an arrest on their record). Although in a \$19 trillion dollar economy, this may not sound substantial, it is estimated that the War on Drugs will cost nearly \$1 trillion – meaning the actual cost of the War on Drugs is significantly higher in the impact on lives (and not just the cost of enforcement).

Specifically, this impact is felt, mainly, by low-income Black males. And adding \$53 billion to \$220 billion to low-income minority households would have a life-changing impact. These estimates also ignore the external impacts of these policies on the families, jobs, and educational attainment of their children.

At the extreme, given these estimates, if the policy intent of the War on Drugs is to reduce or eliminate drug use, arrest rates should be equal across racial groups. Anything short of equal arrest rates for illegal drugs can be seen as an indirect way to enforce Jim Crow laws (as argued in Alexander, 2010 – given the equal usage rates). At the other end of this policy, if the drug usage rates are not worthy of high drug arrest rates in the White population, then there is

simply no reason to keep drug arrest rates this high in the Black populations (and many arguments to help those incarcerated under these laws to have advanced assistance re-entering society, as to not have the productivity penalty found in this study).

This study also shows the continued racial impact of having to check the box as these people seek employment after their arrest or incarceration – providing a numerical value to ban-the-box movement. These major impacts on lost wages should be considered for multiple levels of drug related policies (legalization, policing, etc.) and how these impacts effect re-entry into society and employment prospects in general. Additional research on the topic is encouraged, especially further research on arrest rates across locations (i.e., cities that have different racial makeups and different racial disparities in arrests and incarceration rates).

## Works Cited

- Alexander, Michelle. (2010). *The new Jim Crow: mass incarceration in the age of colorblindness*. New York : [Jackson, Tenn.] :New Press ; Distributed by Perseus Distribution
- Arvanites, Thomas M. and Martin Asher (1998) State and County Incarceration Rates: The Direct and Indirect Effects of Race and Inequality *American Journal of Economics and Sociology* Vol. 57, No 2
- Avery, Beth and Han Lu (2020) Ban the Box *National Employment Law Project* (<https://www.nelp.org/publication/ban-the-box-fair-chance-hiring-state-and-local-guide/>, September 30, 2020)
- Bell R, Wechsler H, Johnston LD. (1997) Correlates of college student marijuana use: Results of a US national survey. *Addiction* 92:571–581. [PubMed: 9219379]
- Bhuller M, Dahl GB, Løken KV, Mogstad M (2016) Incarceration, Recidivism and Employment. *National Bureau of Economic Research working paper* w22648
- Boyd C, McCabe SE, d’Arcy H. (2003) Ecstasy use among college undergraduates: Gender, race and sexual identity. *Journal of Substance Abuse Treatment* 24:209–215.
- Brown, Christian (2019) Incarceration and Earnings: Distributional and Long-Term Effects. *Journal of Labor Research* 40:58–83
- Campbell, Michael C., Matt Vogel, and Joshua Williams (2015) Historical Contingencies and the Evolving importance of Race, Violent Crime, and Region in Explaining Mass incarceration in the United States *Criminology* 52(2), 180-203
- Freeman, Richard B. (1991a) Crime and the Employment of Disadvantaged Youth. *National Bureau of Economic Research working paper* w3875

- Freeman, Richard B. (1991b) “Employment and Earnings of Disadvantaged Young Men in a Labor Shortage Economy.” In *The Urban Underclass*, edited by Christopher Jencks and Paul E. Petersen. Washington, D.C.: Brookings Institution Press.
- Freeman, Richard B., Eunice Han, David Madland, and Brendan V. Duke. (2015) How Does Declining Unionism Affect the American Middle Class and Intergenerational Mobility? *National Bureau of Economic Research working paper w21638*
- Grogger, Jeff. (1995) The Effect of Arrests on the Employment and Earnings of Young Men. *Quarterly Journal of Economics* 110(10): 51–71.
- Grogger, Jeff. (1992) Arrests, Persistent Youth Joblessness, and Black/White Employment Differentials. *Review of Economics and Statistics* 74(1): 100–106.
- Holzer H (2009) Collateral costs: effects of incarceration on employment and earnings among young workers. In *Do prisons make us safer? The benefits and costs of the prison boom*, edited by Raphael, S. and Stoll, M. A., 239–265
- Huizinga, David and Delbert S. Elliott (1987) Juvenile Offenders: Prevalence, Offender Incidence, and Arrest Rates by Race *Crime and Delinquency* Vol 33, Issue 2, 206-223
- Kling JR (1999) The Effect of Prison Sentence Length on the Subsequent Earnings and Employment of Criminal Defendants. *Princeton discussion paper 208*
- Krisberg, Barry, Ira Schwartz, Gideon Fishman, Zvi Eisikovits, Edna Guttman, and Karen Joe (1987) The Incarceration of Minority Youth *Crime and Delinquency* Vol. 33, No. 2, 173-205
- Lyons CJ, Pettit B (2011) Compounded disadvantage: race, incarceration, and Wage Growth. *Soc Probl* 58(2):257–280

- Mauer, Marc and Ryan S. King (2007) Uneven Justice: State Rates of Incarceration By Race and Ethnicity *The Sentencing Project*
- McCabe SE, Knight JR, Teter CJ, Wechsler H. (2005a) Non-medical use of prescription stimulants among US college students: Prevalence and correlates from a national survey. *Addiction* 100:96–106.
- McCabe SE, Teter CJ, Boyd CJ, Knight JR, Wechsler H. (2005b) Non-medical use of prescription opioids among U.S. college students: Prevalence and correlates from a national survey. *Addictive Behaviors* 30:789–805.
- McCabe SE. (2005) Correlates of nonmedical use of prescription benzodiazepine anxiolytics: Results from a national survey of U.S. college students. *Drug and Alcohol Dependence* 2005;79:53–62.
- McCabe, Sean E., Michele Morales, James A. Cranford, Jorge Delva, Melnee D. McPherson, and Carol J. Boyd (2007) Race/Ethnicity and Gender Differences in Drug Use and Abuse Among College Students *J Ethn Subst Abuse* 6(2): 75–95.
- Meilman PW, Presley CA, Cashin JR. (1995) The sober social life at Historically Black Colleges. *Journal of Blacks in Higher Education* 9:98–100.
- Mohler-Kuo M, Lee JE, Wechsler H. (2003) Trends in marijuana and other illicit drug use among college students. Results from Harvard School of Public Health College Alcohol Study Surveys: 1993– 2001. *Journal of American College Health* 52:17–24.
- Mueller-Smith M (2015) The criminal and labor market impacts of incarceration. *Working paper*
- Needels KE (1996) Go directly to jail and do not collect? A long-term study of recidivism, employment, and earnings patterns among prison Releasees. *J Res Crime Delinq* 33(4):471–496

- Pestersilia, Joan. 1983 “Racial Disparities in the Criminal Justice System” Santa Monica, CA: *The Rand Corporation*.
- Pettit B, Lyons CJ (2007) Status and the Stigma of Incarceration: The Labor-Market Effects of Incarceration, by Race, Class, and Criminal Involvement. *In Barriers to Reentry? The Labor Market for Released Prisoners in Post-Industrial America*, 203–226
- Pettit B, Lyons CJ (2009) Incarceration and the legitimate labor market: examining age-graded effects on employment and wages. *Law Soc Rev* 43(4):725–756
- Pew (2018) More Imprisonment Does Not Reduce State Drug Problems *The Pew Charitable Trusts: A Brief* (<https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/03/more-imprisonment-does-not-reduce-state-drug-problems>)
- Ramakers A, van Wilsem J, Apel R (2012) The effect of labour market absence on finding employment: a comparison between ex-prisoners and unemployed future prisoners. *Eur J Criminology* 9(4):442–461
- Raphael S (2007) Early Incarceration Spells and the Transition to Adulthood. In *The Price of Independence: The Economics of Early Adulthood*, 278–305
- Smith, Sandra Susan, and Jonathan Simon. (2020) Exclusion and Extraction: Criminal Justice Contact and the Reallocation of Labor. *RSF: The Russell Sage Foundation Journal of the Social Sciences* 6(1): 1–27.
- Strote J, Lee JE, Wechsler H. (2002) Increasing MDMA use among college students: Results of a national survey. *Journal of Adolescent Health* 30:64–72.
- Rovner, Josh (2021) Black Disparities in Youth Incarceration *The Sentencing Project* ([www.sentencingproject.org](http://www.sentencingproject.org), July 15, 2021)

- Tonry, Michael (1994) Race and the War on Drugs. *University of Chicago Legal Forum*: Vol. Iss. 1, Article 4.
- Visher CA, Debus S, Yahner J (2008) Employment after prison: a longitudinal study of releases in three states. *Urban Institute, Justice policy center*
- Waldfogel J (1994) Does conviction have a persistent effect on income and employment? *Int Rev Law Econ* 14(1):103–119
- Western B, Kling JR, Weiman DF (2001) The labor market consequences of incarceration. *Crime and Delinquency* 47(3):410–427
- Western, Bruce. (2002) The Impact of Incarceration on Wage Mobility and Inequality. *American Sociological Review* 67(4): 526–46.
- Western, Bruce. (2006) Punishment and Inequality in America. *New York: Russell Sage Foundation*
- Yang CS (2017) Local labor markets and criminal recidivism. *J Public Econ* 147:16–29



## Appendix

Table 1A: Trends in arrest rates for Drug abuse violations (rates are per 100,000, all ages)

Years	All races	White	Black	American Indian	Asian
1980	255.7	225.8	504.9	178.9	64.8
1981	244	210.6	517.5	155.1	71.8
1982	291.8	248.7	643.3	182.1	79.2
1983	282.9	232.8	683	163.2	84.8
1984	300.4	245.1	743.4	181.9	70.3
1985	341	276	858.1	215.8	86.5
1986	343.2	267.2	944.6	197.5	61.6
1987	386.9	295	1,109.60	202	67
1988	472.5	337.8	1,509.30	242.3	82.1
1989	551.7	384.1	1,846.40	227.3	49
1990	436.5	306.2	1,435.60	182.9	61.7
1991	399.2	275.4	1,337.80	167.4	64.2
1992	415.7	292.3	1,348.50	191.5	66.9
1993	433.3	312.1	1,351.00	212.4	65.8
1994	513.6	382.3	1,514.10	250.8	80.8
1995	554.3	413	1,625.70	291.5	87.9
1996	559.1	419.7	1,614.30	310.4	93.4
1997	580.8	440.4	1,643.30	331.5	103
1998	565.2	426	1,616.40	304.4	91.1
1999	549.1	422.8	1,511.50	311.2	86.8
2000	559.8	436.3	1,508.10	304.9	89.8
2001	556.9	436.8	1,482.90	284.8	93.3
2002	535	426.8	1,377.20	297.3	90.9
2003	578.5	466.8	1,458.20	320.7	95
2004	596.5	482.5	1,501.00	320.5	87.8
2005	624.8	505	1,572.60	345.9	92.4
2006	633.4	503.9	1,646.50	319.1	89.5
2007	611.2	488.8	1,573.10	310	84.6
2008	559.9	450.3	1,425.40	275.5	77.5
2009	542.3	444.4	1,330.90	266.5	74.9
2010	529.8	445.1	1,231.80	263.1	81.1
2011	491.4	415.2	1,127.30	253.1	77.2
2012	494.6	419.6	1,116.00	252.9	98.8
2013	474.9	408	1,040.20	266.8	93.6
2014	490.4	429.2	1,028.00	292.3	97.1
2015	464.1	418.5	898	335.8	94
2016	486.8	441.8	927.7	348.5	98
2017	502.2	453.3	967.3	415.2	98.8
2018	505.6	458.8	965.1	400.3	97

Table 2A: Total number of arrests; Blacks, Whites, and Blacks if arrested at the White arrest rate

Years	All races	Black	Blacks arrested if arrested at the White rate (per 100,000)
1980	580,900	135,160	60,445.89
1981	559,900	140,420	57,144.83
1982	676,000	176,960	68,412.80
1983	661,400	190,340	64,877.24
1984	708,400	209,730	69,148.27
1985	811,400	245,150	78,850.25
1986	824,100	273,380	77,331.29
1987	937,400	325,380	86,506.04
1988	1,155,200	448,620	100,406.70
1989	1,361,700	556,580	115,783.35
1990	1,089,500	439,980	93,843.60
1991	1,010,000	418,600	86,173.15
1992	1,066,400	431,250	93,477.47
1993	1,126,300	440,900	101,854.10
1994	1,351,400	503,580	127,150.54
1995	1,476,100	550,250	139,787.94
1996	1,506,200	555,580	144,444.61
1997	1,583,600	575,270	154,170.82
1998	1,559,100	575,330	151,627.43
1999	1,532,200	546,750	152,938.07
2000	1,579,570	553,910	160,248.61
2001	1,586,900	552,380	162,707.93
2002	1,538,810	519,890	161,116.07
2003	1,678,190	557,170	178,361.65
2004	1,746,570	581,460	186,911.69
2005	1,846,350	617,740	198,371.30
2006	1,889,810	656,230	200,834.68
2007	1,841,180	636,340	197,726.14
2008	1,702,540	585,120	184,846.03
2009	1,663,580	554,110	185,022.53
2010	1,638,850	519,830	187,835.96
2011	1,531,250	481,430	177,317.25
2012	1,552,430	482,400	181,375.48
2013	1,501,040	454,930	178,438.22
2014	1,561,230	454,960	189,950.23
2015	1,488,710	402,150	187,416.23
2016	1,572,580	420,300	200,160.12
2017	1,632,920	442,930	207,567.63
2018	1,654,280	446,470	212,247.89

Table 3A: Total Cost of Being Arrested Black, Wage is the 20<sup>th</sup> Percentile for Black Earners (in 2019-Dollars)

Year	Extra Blacks arrested for being Black (and not White)	Hourly Wage	Weekly Earnings	Yearly (50 weeks)	Cost of Being Black each Year	Cumulative Cost of Being Black
1980	74,714.11	\$9.62	\$384.80	\$19,240.00	\$594,156,488.36	\$594,156,488.36
1981	83,275.17	\$9.52	\$380.80	\$19,040.00	\$652,827,367.70	\$1,246,983,856.06
1982	108,547.20	\$9.33	\$373.20	\$18,660.00	\$836,508,142.08	\$2,083,491,998.14
1983	125,462.76	\$9.13	\$365.20	\$18,260.00	\$951,810,682.46	\$3,035,302,680.61
1984	140,581.73	\$8.95	\$358.00	\$17,900.00	\$1,057,118,376.91	\$4,092,421,057.51
1985	166,299.75	\$8.94	\$357.60	\$17,880.00	\$1,251,472,138.65	\$5,343,893,196.16
1986	196,048.71	\$8.97	\$358.80	\$17,940.00	\$1,480,795,116.37	\$6,824,688,312.54
1987	238,873.96	\$8.88	\$355.20	\$17,760.00	\$1,807,511,480.53	\$8,632,199,793.06
1988	348,213.30	\$9.07	\$362.80	\$18,140.00	\$2,662,578,177.12	\$11,294,777,970.18
1989	440,796.65	\$9.03	\$361.20	\$18,060.00	\$3,380,293,190.19	\$14,675,071,160.37
1990	346,136.40	\$9.33	\$373.20	\$18,660.00	\$2,679,995,690.64	\$17,355,066,851.01
1991	332,426.85	\$9.19	\$367.60	\$18,380.00	\$2,550,312,307.83	\$19,905,379,158.84
1992	337,772.53	\$9.07	\$362.80	\$18,140.00	\$2,579,433,702.60	\$22,484,812,861.44
1993	339,045.90	\$9.10	\$364.00	\$18,200.00	\$2,598,786,823.50	\$25,083,599,684.94
1994	376,429.46	\$8.96	\$358.40	\$17,920.00	\$2,903,174,567.30	\$27,986,774,252.25
1995	410,462.06	\$9.25	\$370.00	\$18,500.00	\$3,248,232,558.02	\$31,235,006,810.26
1996	411,135.39	\$9.21	\$368.40	\$18,420.00	\$3,306,433,033.46	\$34,541,439,843.72
1997	421,099.18	\$9.52	\$380.80	\$19,040.00	\$3,497,312,909.74	\$38,038,752,753.46
1998	423,702.57	\$9.93	\$397.20	\$19,860.00	\$3,641,469,367.61	\$41,680,222,121.06
1999	393,811.93	\$10.42	\$416.80	\$20,840.00	\$3,481,612,510.74	\$45,161,834,631.81
2000	393,661.39	\$10.46	\$418.40	\$20,920.00	\$3,504,767,355.17	\$48,666,601,986.98
2001	389,672.07	\$10.54	\$421.60	\$21,080.00	\$3,497,384,762.66	\$52,163,986,749.64
2002	358,773.93	\$10.82	\$432.80	\$21,640.00	\$3,255,012,357.32	\$55,418,999,106.96
2003	378,808.35	\$11.02	\$440.80	\$22,040.00	\$3,439,201,009.65	\$58,858,200,116.61
2004	394,548.31	\$10.79	\$431.60	\$21,580.00	\$3,523,789,866.27	\$62,381,989,982.88
2005	419,368.70	\$10.50	\$420.00	\$21,000.00	\$3,697,825,449.12	\$66,079,815,432.00
2006	455,395.32	\$10.36	\$414.40	\$20,720.00	\$4,011,850,611.07	\$70,091,666,043.07
2007	438,613.86	\$10.57	\$422.80	\$21,140.00	\$3,894,627,908.48	\$73,986,293,951.56
2008	400,273.97	\$10.56	\$422.40	\$21,120.00	\$3,545,866,990.64	\$77,532,160,942.20
2009	369,087.47	\$10.73	\$429.20	\$21,460.00	\$3,266,719,379.48	\$80,798,880,321.68
2010	331,994.04	\$10.62	\$424.80	\$21,240.00	\$2,890,738,505.09	\$83,689,618,826.76
2011	304,112.75	\$10.28	\$411.20	\$20,560.00	\$2,594,385,870.25	\$86,284,004,697.01
2012	301,024.52	\$10.07	\$402.80	\$20,140.00	\$2,549,918,504.02	\$88,833,923,201.03
2013	276,491.78	\$10.02	\$400.80	\$20,040.00	\$2,344,705,592.76	\$91,178,628,793.79
2014	265,009.77	\$9.91	\$396.40	\$19,820.00	\$2,260,268,328.33	\$93,438,897,122.12
2015	214,733.77	\$10.17	\$406.80	\$20,340.00	\$1,871,361,858.80	\$95,310,258,980.91
2016	220,139.88	\$10.57	\$422.80	\$21,140.00	\$1,952,376,567.74	\$97,262,635,548.66
2017	235,362.37	\$10.46	\$418.40	\$20,920.00	\$2,084,557,438.62	\$99,347,192,987.27
2018	234,222.11	\$10.62	\$424.80	\$21,240.00	\$2,089,448,598.89	\$101,436,641,586.16

Table 4A: Incarceration Rates (for arrest rates in Table 2A); the Black Incarceration rate of the Black Arrest rate, the Black Incarceration rate if they were arrested at the White Arrest Rate and Incarcerated at the White rate, and the ratio of these two different Incarceration Rates.

Years	Black Incarceration (at 20% rate of incarceration)	Black Incarceration at the White Arrest rate and White Incarceration rate (5%)	Ratio of Column 1 to Column 2
1980	27,032	3,022.29	8.9
1981	28,084	2,857.24	9.8
1982	35,392	3,420.64	10.3
1983	38,068	3,243.86	11.7
1984	41,946	3,457.41	12.1
1985	49,030	3,942.51	12.4
1986	54,676	3,866.56	14.1
1987	65,076	4,325.30	15.0
1988	89,724	5,020.34	17.9
1989	111,316	5,789.17	19.2
1990	87,996	4,692.18	18.8
1991	83,720	4,308.66	19.4
1992	86,250	4,673.87	18.5
1993	88,180	5,092.71	17.3
1994	100,716	6,357.53	15.8
1995	110,050	6,989.40	15.7
1996	111,116	7,222.23	15.4
1997	115,054	7,708.54	14.9
1998	115,066	7,581.37	15.2
1999	109,350	7,646.90	14.3
2000	110,782	8,012.43	13.8
2001	110,476	8,135.40	13.6
2002	103,978	8,055.80	12.9
2003	111,434	8,918.08	12.5
2004	116,292	9,345.58	12.4
2005	123,548	9,918.57	12.5
2006	131,246	10,041.73	13.1
2007	127,268	9,886.31	12.9
2008	117,024	9,242.30	12.7
2009	110,822	9,251.13	12.0
2010	103,966	9,391.80	11.1
2011	96,286	8,865.86	10.9
2012	96,480	9,068.77	10.6
2013	90,986	8,921.91	10.2
2014	90,992	9,497.51	9.6
2015	80,430	9,370.81	8.6
2016	84,060	10,008.01	8.4
2017	88,586	10,378.38	8.5

2018	89,294	10,612.39	8.4
------	--------	-----------	-----

Table 5A: Total Cost of Being Incarcerated Black, Wage is the 20<sup>th</sup> Percentile for Black Earners (in 2019-Dollars, relative to these Black individuals being arrested and incarcerated at the White rate).

Year	Excess Blacks Incarcerated for not being White	Hourly Wage	Weekly Earnings	Yearly (50 weeks)	Cost of Being Black each Year	Cumulative Cost of Being Black
1980	24,009.71	\$9.62	\$ 384.80	\$ 19,240.00	\$ 367,659,056.57	\$ 367,659,056.57
1981	25,226.76	\$9.52	\$ 380.80	\$ 19,040.00	\$ 381,068,171.25	\$ 748,727,227.82
1982	31,971.36	\$9.33	\$ 373.20	\$ 18,660.00	\$ 474,484,779.71	\$ 1,223,212,007.53
1983	34,824.14	\$9.13	\$ 365.20	\$ 18,260.00	\$ 508,292,868.85	\$ 1,731,504,876.38
1984	38,488.59	\$8.95	\$ 358.00	\$ 17,900.00	\$ 555,857,913.09	\$ 2,287,362,789.47
1985	45,087.49	\$8.94	\$ 357.60	\$ 17,880.00	\$ 651,287,530.60	\$ 2,938,650,320.07
1986	50,809.44	\$8.97	\$ 358.80	\$ 17,940.00	\$ 736,887,072.70	\$ 3,675,537,392.77
1987	60,750.70	\$8.88	\$ 355.20	\$ 17,760.00	\$ 880,523,318.83	\$ 4,556,060,711.60
1988	84,703.66	\$9.07	\$ 362.80	\$ 18,140.00	\$ 1,243,396,534.90	\$ 5,799,457,246.51
1989	105,526.83	\$9.03	\$ 361.20	\$ 18,060.00	\$ 1,551,181,929.12	\$ 7,350,639,175.62
1990	83,303.82	\$9.33	\$ 373.20	\$ 18,660.00	\$ 1,241,100,962.62	\$ 8,591,740,138.25
1991	79,411.34	\$9.19	\$ 367.60	\$ 18,380.00	\$ 1,171,412,876.25	\$ 9,763,153,014.50
1992	81,576.13	\$9.07	\$ 362.80	\$ 18,140.00	\$ 1,195,640,780.23	\$ 10,958,793,794.73
1993	83,087.29	\$9.10	\$ 364.00	\$ 18,200.00	\$ 1,222,872,087.24	\$ 12,181,665,881.96
1994	94,358.47	\$8.96	\$ 358.40	\$ 17,920.00	\$ 1,391,762,144.43	\$ 13,573,428,026.39
1995	103,060.60	\$9.25	\$ 370.00	\$ 18,500.00	\$ 1,561,719,320.52	\$ 15,135,147,346.92
1996	103,893.77	\$9.21	\$ 368.40	\$ 18,420.00	\$ 1,594,409,481.48	\$ 16,729,556,828.40
1997	107,345.46	\$9.52	\$ 380.80	\$ 19,040.00	\$ 1,701,899,578.55	\$ 18,431,456,406.95
1998	107,484.63	\$9.93	\$ 397.20	\$ 19,860.00	\$ 1,765,266,511.85	\$ 20,196,722,918.80
1999	101,703.10	\$10.42	\$ 416.80	\$ 20,840.00	\$ 1,723,829,304.63	\$ 21,920,552,223.43
2000	102,769.57	\$10.46	\$ 418.40	\$ 20,920.00	\$ 1,753,349,578.38	\$ 23,673,901,801.81
2001	102,340.60	\$10.54	\$ 421.60	\$ 21,080.00	\$ 1,760,206,740.34	\$ 25,434,108,542.15
2002	95,922.20	\$10.82	\$ 432.80	\$ 21,640.00	\$ 1,671,713,684.54	\$ 27,105,822,226.69
2003	102,515.92	\$11.02	\$ 440.80	\$ 22,040.00	\$ 1,793,259,730.60	\$ 28,899,081,957.29
2004	106,946.42	\$10.79	\$ 431.60	\$ 21,580.00	\$ 1,838,693,009.49	\$ 30,737,774,966.78
2005	113,629.43	\$10.50	\$ 420.00	\$ 21,000.00	\$ 1,924,613,015.19	\$ 32,662,387,981.97
2006	121,204.27	\$10.36	\$ 414.40	\$ 20,720.00	\$ 2,046,186,000.29	\$ 34,708,573,982.26
2007	117,381.69	\$10.57	\$ 422.80	\$ 21,140.00	\$ 2,001,812,316.40	\$ 36,710,386,298.66
2008	107,781.70	\$10.56	\$ 422.40	\$ 21,120.00	\$ 1,834,094,027.91	\$ 38,544,480,326.57
2009	101,570.87	\$10.73	\$ 429.20	\$ 21,460.00	\$ 1,731,607,006.47	\$ 40,276,087,333.04
2010	94,574.20	\$10.62	\$ 424.80	\$ 21,240.00	\$ 1,587,851,261.12	\$ 41,863,938,594.16
2011	87,420.14	\$10.28	\$ 411.20	\$ 20,560.00	\$ 1,435,314,562.20	\$ 43,299,253,156.36
2012	87,411.23	\$10.07	\$ 402.80	\$ 20,140.00	\$ 1,421,534,218.64	\$ 44,720,787,375.01
2013	82,064.09	\$10.02	\$ 400.80	\$ 20,040.00	\$ 1,334,803,279.95	\$ 46,055,590,654.95
2014	81,494.49	\$9.91	\$ 396.40	\$ 19,820.00	\$ 1,329,853,166.06	\$ 47,385,443,821.01

2015	71,059.19	\$10.17	\$ 406.80	\$ 20,340.00	\$ 1,185,141,088.08	\$ 48,570,584,909.09
2016	74,051.99	\$10.57	\$ 422.80	\$ 21,140.00	\$ 1,261,646,265.43	\$ 49,832,231,174.52
2017	78,207.62	\$10.46	\$ 418.40	\$ 20,920.00	\$ 1,328,455,280.13	\$ 51,160,686,454.66
2018	78,681.61	\$10.62	\$ 424.80	\$ 21,240.00	\$ 1,347,987,819.94	\$ 52,508,674,274.59