

## Economic Brief

March 2021, No. 21-07

# Incarceration's Life-Long Impact on Earnings and Employment

Article by: [Grey Gordon](#) and [Urvi Neelakantan](#)

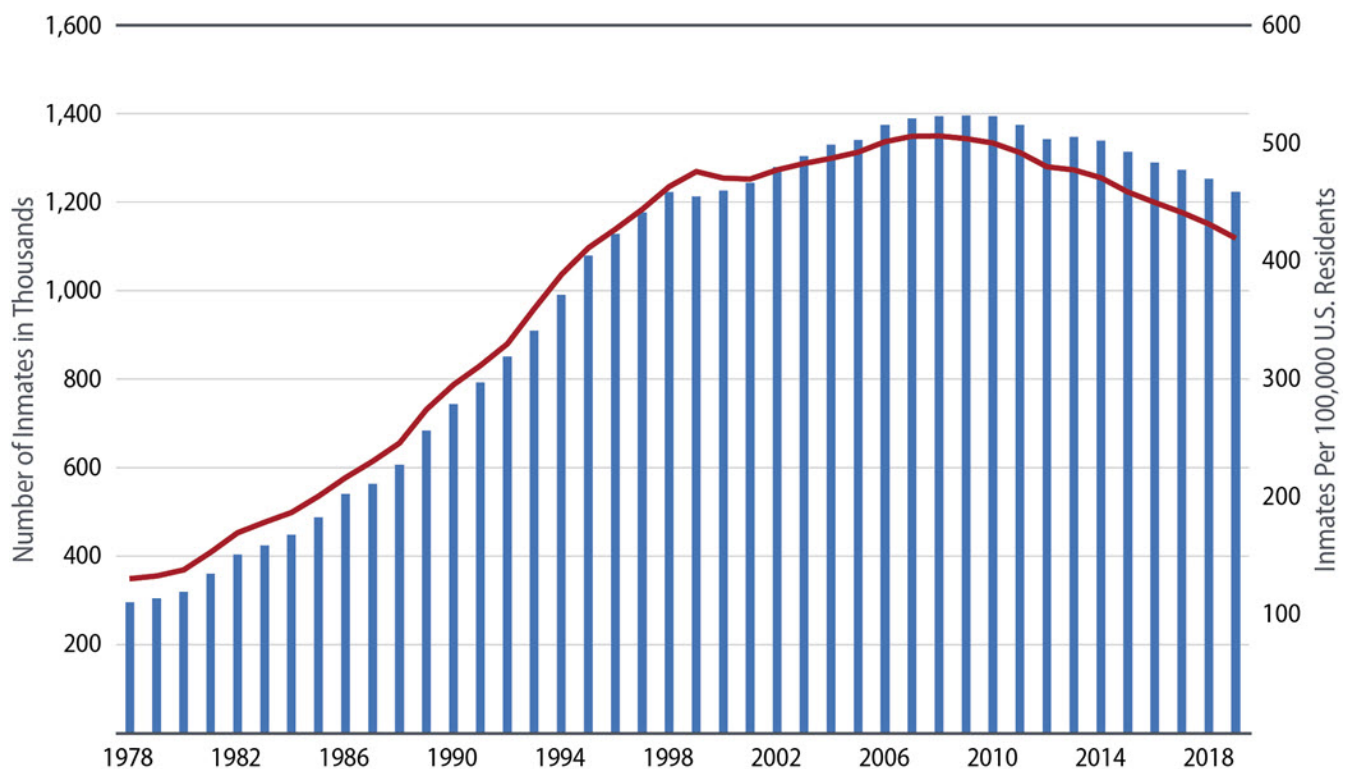


We estimate the impact of incarceration on individuals' earnings and employment prospects using a statistical model that controls for race, gender, education and other factors. The model reveals that first-time incarceration for black men with a high school diploma reduces expected lifetime earnings by 33 percent and employment by 22 percent. For high school educated white men, it reduces expected lifetime earnings by 43 percent and employment by 27 percent.

---

Incarceration has surged in the United States over the past few decades. As seen in Figure 1, from 1978 through 2019, the number of inmates in state or federal correctional facilities increased from fewer than 300,000 to more than 1.2 million, and the incarceration rate rose from 0.13 percent to 0.42 percent of the population. This increase has had disparate effects on the U.S. population because incarceration rates differ substantially by gender, race and education. For example, the incarcerated population is overwhelmingly male (93 percent) and less educated.<sup>1</sup> Moreover, the imprisonment rate for black men (2.2 percent) is nearly six times higher than for white men.<sup>2</sup> Given the high and uneven incidence of incarceration, it is important to understand the impact of incarceration on earnings and employment over a person's lifetime.

**Figure 1: Incarcerated Populaton (Blue Bars/Left Axis) and Incarceration Rate (Red Line/Right Axis)**



Source: Bureau of Justice Statistics (using the corrections statistical analysis tool at [www.bjs.gov](http://www.bjs.gov))

Notes: Bars represent the number of inmates in state or federal prisons in the United States (left axis), excluding privately owned facilities. The red line represents the incarceration rate, the number of inmates per 100,000 U.S. residents (right axis).

[Enlarge](#)

Yet surprisingly little is known about the impact of incarceration on employment and earnings, particularly across demographic groups. This is due partly to lack of data: Most household surveys are limited to the noninstitutionalized civilian population. In their work on the prison boom in the United States, economists Derek Neal of the University of Chicago and Armin Rick of Cornell University call for more research on the effects of incarceration on "the employment and earnings prospects of less-skilled men, and less-skilled black men in particular."<sup>3</sup> New research by the authors of this brief, along with Richmond Fed colleagues John Bailey Jones and Kartik Athreya, attempts to meet this challenge.<sup>4</sup>

We construct a statistical model of earnings that accounts for incarceration risk in addition to other forms of nonemployment risk, such as unemployment and disability.<sup>5</sup> We find that the impact of incarceration on earnings is enormous, particularly for men with a high school diploma or less. One key finding is that first-time incarceration reduces the expected lifetime earnings of high school graduates by 33 percent for black men and 43 percent for white men. (The larger percent decline for white men reflects the fact that white high school graduates have higher earnings than black high school graduates on average.) This massive reduction in lifetime earning is largely due to a reduction in average working years — 7.6 fewer for black men and 9.4 fewer for white men.

## **Methodology**

Our primary data source is the National Longitudinal Survey of Youth that began in 1979, one of the few household panel data sets that reports incarceration. This data set allows us to follow a group of individuals who were youths in 1979 over time and observe their earnings, employment and incarceration status.

Our statistical model describes how likely a person is to be incarcerated, jobless or employed (and, if employed, how much they earn). This likelihood depends on a number of factors, such as education, race, gender, current earnings, employment and incarceration history.<sup>6</sup> The model also distinguishes between temporary and persistent joblessness and earnings shocks. For example, if an individual were unemployed for a year and then found a job with a lower salary, the model generally would predict a temporary jobless spell followed by a persistent reduction in earnings. Alternatively, if a person became disabled later in life, then the model likely would predict persistent joblessness. Additionally, the model allows for asymmetry, such as an increase in earnings being more persistent than a decrease in earnings. The model also accounts for the fact that incarcerated people are more likely to be missing from the data.

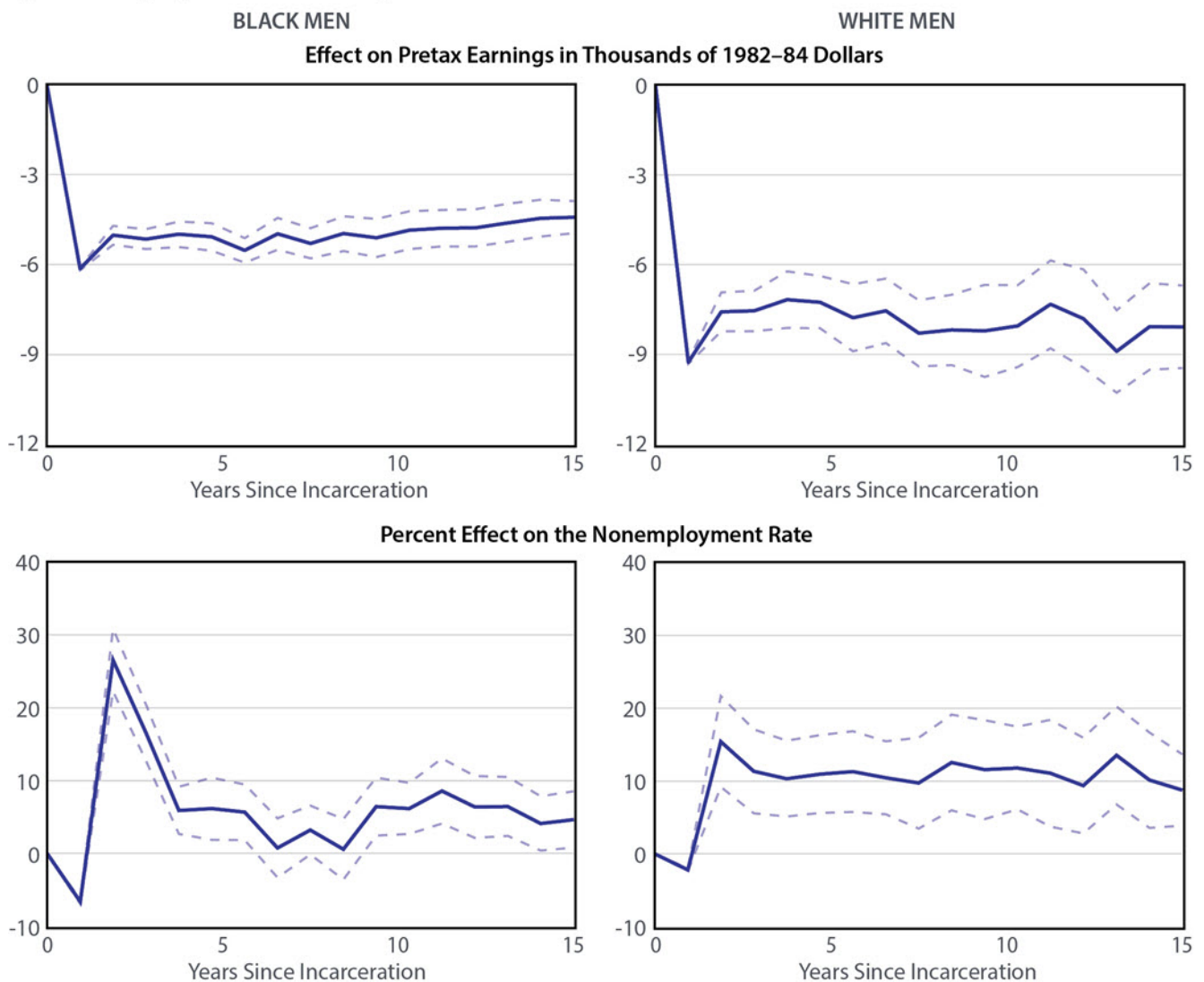
We estimate the model, a process that aligns the predictions of the model with actual data as closely as possible. We use the estimated model to create an artificial data set that contains a huge number of observations, has no missing data, and distinguishes between persistent and transitory earnings and nonemployment shocks. Consequently, if we saw an individual make \$25,000 in 1993, go to jail in 1994 and make \$15,000 in 1995, for example, we could attribute \$8,000 of that decrease to a persistent drop in earnings and \$2,000 to a temporary drop. More importantly, we could predict the hypothetical individual's entire future employment path.

## **Results**

We show that the implications of incarceration are profound. For instance, a typical 25-year-old black high school graduate entering jail for the first time will suffer a lifetime income loss of \$137,000 in 1982–84 dollars, a 33 percent drop.<sup>7</sup> A typical 25-year-old white high school graduate entering jail for the first time will suffer a lifetime income loss of \$400,000, a 43 percent drop. For those without a high school diploma, the losses amount to \$129,000 and \$261,000, respectively, resulting in 50 percent drops for both black and white men. These large effects follow from the fact that the drop in earnings experienced after prison will last a lifetime.

One way to see the effects of incarceration is by comparing two groups of individuals who are exactly the same in the model until a point in time, say 1995, when their paths diverge. The first group — the treated group — goes to prison in 1996, while the second group — the control group — stays free. The difference between the first group and the second group from 1996 on reveals the average effect of incarceration, as seen in Figure 2.

**Figure 2: Employment and Earnings Effects of First-Time Incarceration for Black Men and White Men**



**Source:** Grey Gordon, John Bailey Jones, Urvi Neelakantan and Kartik Athreya, "Incarceration, Earnings, and Race," Federal Reserve Bank of Richmond, Manuscript, March 2021.

**Notes:** The figure represents men who had not been incarcerated previously. They had not graduated from high school and were earning average levels of pay for their race and education group before going to prison. The dotted lines represent upper and lower bounds of confidence intervals.

[Enlarge](#)

Figure 2 shows the effects of first-time incarceration on black and white men with less than a high school diploma. The top row illustrates the effect on earnings, and the bottom row illustrates the effect on the jobless rate. The blue lines in each of the panels start at zero, which indicates that the incarcerated and nonincarcerated are identical (within their race and education group) up to the point at which the incarceration shock occurs.

The top left panel reveals an initial \$6,000 annual earnings loss for a black man from going to jail or prison. A few years after the shock, this annual loss decreases but not by much. Even 15 years after the shock, the difference between the earnings of the incarcerated group and the control group still exceeds \$4,000 a year. Consequently, incarceration translates into a substantial loss in lifetime earnings.

Turning now to the effect of incarceration on joblessness, the bottom left panel of Figure 2 shows that among black men, the joblessness rate is more than 25 percent higher for a man who has been incarcerated, compared with an otherwise identical man. This gap narrows over the next few years but is statistically significant even 10 years later.<sup>8</sup> Consequently, incarceration leads not only to lower earnings, but also to persistently lower employment rates later in life.

Incarceration also has persistently negative effects on white men. For example, pretax annual earnings (shown in the top right panel of Figure 2) drop by around \$8,000 a year, seemingly for life. Similarly, jobless rates (in the bottom right panel of the figure) increase by around 10 percentage points.

While Figure 2 illustrates the effects of first-time incarceration, both on impact and over time, it only considers two groups, black men and white men without high school diplomas who had never before been incarcerated. We summarize the effects of incarceration for more groups of individuals in Table 1, using the same comparison of treatment and control groups. We report the effects separately for black and white men (B/W), for those with a high school degree and those with less than a high school degree (H/L) and for those with an incarceration record (r) and those without.

**Table 1: Estimated Effects of Incarceration**

Average Treatment Effects for a Transition to Jail								
Response Variable	BL	WL	BLr	Wlr	BH	WH	BHr	WHr
Lifetime Earnings	-129	-261	-64	-201	-137	-400	-165	-409
Future Years Nonemployed	1.4	4.2	0.8	2.0	2.3	3.6	2.0	4.2
Future Years in Jail	7.9	7.0	3.6	5.3	5.3	5.8	4.4	9.0

Source: Authors' calculations based on a statistical model calibrated with data from the 1979 National Longitudinal Survey of Youth  
Notes: Earnings are in thousands of 1982-84 dollars. B = Black W = White L = Less than High School Education  
H = High School Education r = Incarceration Record

[Enlarge](#)

For all the groups, the effects of first-time incarceration on lifetime earnings are large, typically ranging from \$100,000 (around \$267,000 in today's dollars) to \$400,000 (around \$1 million today). There is also a strong link between becoming incarcerated and joblessness; those who have experienced incarceration spend an extra 0.8 to 4.2 years without jobs. Additionally, first-time incarceration increases the number of years people from each group will spend in jail or prison (accomplished mostly through jail stints later in life).

## Conclusion

The United States has one of the highest rates of incarceration in the world, a rate that has risen sharply over time. For instance, 15 percent of black men who were born in the late 1940s and did not graduate from high school had been incarcerated by the time they reached their early 30s. That percentage increased to 68 percent for black men who were born in the late 1970s and did not graduate from high school. For white men with the same characteristics, the percentage increased from 4 percent to 28 percent during those 30 years.<sup>9</sup> With such a large fraction of the population, particularly less-educated men, having experienced incarceration, it is important to understand its long-term consequences. Our research contributes to the understanding of the effects of incarceration by using a statistical model of earnings that incorporates the joint movement of earnings, joblessness and incarceration. The model examines differences by race, gender and educational attainment. While it is well known that incarceration disproportionately affects less-educated men, our research provides a quantitative measure of the size and persistence of those effects. We find that incarceration is followed by an essentially permanent drop in earnings that can cause lifetime earnings to fall by up to 50 percent. Incarceration also leads to an increase in the number of years spent unemployed or out of the labor force by as much as four years. Clearly, incarceration has large effects that stay with individuals long after they serve their time.

Grey Gordon is a senior economist and Urvi Neelakantan is a senior policy economist in the Research Department at the Federal Reserve Bank of Richmond.

---

<sup>1</sup> Bureau of Justice Statistics, "Surveys of Inmates in State and Federal Correctional Facilities, 1997."

<sup>2</sup> Data are from the Bureau of Justice Statistics, "Number of Sentenced State and Federal Prisoners per 100,000 U.S. Residents of Corresponding Sex, Race, Hispanic Origin, and Age Groups, December 31, 2019." We used the corrections statistical analysis tool at [www.bjs.gov](http://www.bjs.gov).

<sup>3</sup> Derek Neal and Armin Rick, "The Prison Boom and the Lack of Black Progress after Smith and Welch," National Bureau of Economic Research Working Paper No. 20283, July 2014.

<sup>4</sup> Grey Gordon, John Bailey Jones, Urvi Neelakantan and Kartik Athreya, "Incarceration, Earnings, and Race," Federal Reserve Bank of Richmond, Manuscript, March 2021.

<sup>5</sup> One of the few other papers to estimate the effect of incarceration on earnings is Elizabeth Caucutt, Nezih Guner and Christopher Rauh, "Is Marriage for White People? Incarceration, Unemployment, and the Racial Marriage Divide," Center for Economic and Policy Research Discussion Paper No. 13275, October 2018. They estimate an earnings process for their structural model in which they assume that ex-convicts transition into either unemployment or the lowest possible positive earnings state. Additionally, they assume that the probability that an individual becomes incarcerated in the future depends only on whether the individual is incarcerated at present. While the researchers' model is not structural, it allows for more flexibility in transitions and incarceration.

<sup>6</sup> For the sake of brevity, this summary of our research focuses on men, who constitute 93 percent of the prison population.

<sup>7</sup> Unless otherwise indicated, all dollar amounts in this brief are expressed in 1982–84 dollars.

<sup>8</sup> When the dashed lines above and below the blue line do not encompass zero, the effect is statistically significant. This means that, with a certain degree of confidence, the average effect is not zero.

<sup>9</sup> See Table 1 on page 11 of Bruce Western and Becky Pettit, "Incarceration and Social Inequality," *Daedalus: Journal of the American Academy of Arts and Sciences*, Summer 2010, vol. 139, no. 3, pp. 8–19.

---

This article may be photocopied or reprinted in its entirety. Please credit the authors, source, and the Federal Reserve Bank of Richmond and include the italicized statement below.

*Views expressed in this article are those of the authors and not necessarily those of the Federal Reserve Bank of Richmond or the Federal Reserve System.*

---

## Subscribe to Economic Brief

Receive an email notification when Economic Brief is posted online:

### **Contact Us**

---

**Karl Rhodes**

(804) 697-8144