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**Understanding the Causes and Labor Market Consequences of the Steep Increase in U.S.
Incarceration Rates**

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Abstract

The United States currently incarcerates its residents at a rate that is greater than every other country in the world. Aggregating the state and federal prison populations as well as inmates in local jails, there were 737 inmates per 100,000 U.S. residents in 2005. This compares with a world average of 166 per 100,000 and an average among European Community member states of 135. This chapter asks and answers three questions pertaining to U.S. incarceration trends and their impacts on social inequality. First, why has the U.S. incarceration rate increased so much in recent decades? Second, what is the incidence of the increase in U.S. incarceration rates? Finally, how does serving time impact one's employment prospects? I find that the lion's share (over 80 percent) of the 400 percent increase in incarceration rates is attributable to changes in sentencing and parole policy that have increased the incarcerated population along both the extensive and intensive margins. The incidence of this increase has been disproportionately, if almost entirely, born by less educated, prime age, minority men. Incarcerated men fail to accumulate work experience while doing time and face substantial stigma and extremely wary employers post-release. Not surprisingly, those demographic groups experiencing the largest increases in incarceration over the past few decades have also experienced sharp declines in employment and earnings.

1. Introduction

The United States currently incarcerates its residents at a rate that is greater than every other country in the world. Aggregating the state and federal prison populations as well as inmates in local jails, there were 737 inmates per 100,000 U.S. residents in 2005 (International Centre for Prison Studies 2007). This compares with a world average of 166 per 100,000 and an average among European Community member states of 135. Of the approximately 2.1 million U.S. residents incarcerated in 2005, roughly 65 percent were inmates in state and federal prisons while the remaining 35 percent resided in local jails.

Moreover, current U.S. incarceration rates are unusually high relative to historical figures for the U.S. itself. For the fifty year period spanning the 1920s through the mid 1970s, the number of state and federal prisoners per 100,000 varied within a 10 to 20 unit band around a rate of approximately 110. Beginning in the mid 1970s, however, state prison populations grew at an unprecedented rate, nearly quadrupling between the mid 1970s and the present. Concurrently, the rate of incarceration in local jails more than tripled.

These trends in incarceration rates are a likely source of increasing socioeconomic inequality along a number of dimensions. First there is growing evidence that prior incarceration and conviction adversely impacts the employment prospects of former inmates. Second, recent research has linked the increase in incarceration to a number of secondary negative social externalities impacting the members of the communities that disproportionately comprise the sources of our nation's prison inmates.

In this chapter, I ask three questions. First, why has the U.S. incarceration increased so much? Broadly speaking, an increase in the proportion incarcerated can result from changes in sentencing policy, shifts in criminal behavior, or some combination of the two. Moreover,

behavior and policy are likely to interact with one another, as criminal behavior is likely to respond to corrections policy and policy makers are likely to respond to actual as well as perceived changes in crime. I present a simple set of calculations that decompose the changes in incarceration into its policy and behavioral components accounting for interdependence among these factors. I conclude that while there is some evidence of a higher propensity to offend (under some rather extreme assumptions), the lion's share of the increase in incarceration rate is attributable to stiffer sentencing policy that has increase the use of incarceration along the intensive margin (longer sentences conditional on being sent to prison) as well as an expanded scope of offenses punishable by prison.

Second, what is the incidence of the increase in U.S. incarceration rates? Throughout the latter half of the 20th century, certain sub-groups of the U.S. resident population have been over-represented among the inmates of prisons and jails. For example, men consistently constitute 90 percent of the incarcerated population. In addition, the less educated and minorities comprise proportions of the incarcerated population that far exceed their share of the general population.¹ The increase in incarceration rate fell heavily upon these sub-groups, in particular, prime-age less educated black men. As of the 2000 census, nine percent of black men were incarcerated on any given day, with a figure over a fifth for black high school dropouts. The proportions that have ever served time are even higher.

Finally, how does serving time impact one's employment prospects? I focus on two factors: the effect of incarceration on human capital accumulation, and the potential stigmatizing

¹ Note, this stands in stark contrast to the demographic composition of mental hospitals at mid-century, institutions that housed a population of a comparable order of magnitude when measured relative to the population to the current prison populations. At the peak, the mental hospital inpatient population was half female and minorities were generally represented in this population in proportion to their share of the total resident population of the country. Over the subsequent half century, the mental hospital population declined drastically from over 550,000 inpatients to fewer than 60,000 (Raphael and Stoll 2007).

effect of prior incarceration. I present evidence from administrative data from the California Department of Corrections to analyze the time removed from non-institutionalized society among a cohort of young men who enter the state system during the 1990s. I also analyze data from various employer surveys regarding employer sentiments concerning the hiring of former inmates. I also review the existing research pertaining to the labor market effects of incarceration.

2. Why Are So Many Americans in Prison?

A simple model of steady-state incarceration rates

Over the past three decades, the U.S. prison incarceration rate has increased to unprecedented levels. Figure 1 displays the number of state and federal prison inmates per 100,000 U.S. residents. Prior to the mid 1970s, the incarceration rate was stable, hovering in a narrow band around 110 inmates per 100,000. Thereafter, however, the incarceration rate increases precipitously. Between 1975 and 2004, the prison incarceration rate more than quadrupled, from a rate of 111 to 484 per 100,000. The annual incarceration rate increased by an average of 15.7 inmates per 100,000 per year during the 1980s, 16.8 inmates per year during the 1990s, and 3.1 inmates per year during the first few year of the new century.

Behind this steady increase in the incarceration rate are large flows of inmates into and out of the nation's prisons. While there are certainly many prisoners that are serving very long sentences in the nation's penitentiaries (inmates that are most likely to be captured by point-in-time snapshots of the prison population), there are many more U.S. residents who serve relatively short spells in prison and/or who cycle in and out of correctional institutions serving sequential short spells over substantial portions of their adult lives. As demonstrated by Travis

(2005), nearly all inmates are eventually released from prison, most within five years of admission. Most tellingly, annual admissions to U.S. prisons have consistently hovered around one-half the size of the prison population, while roughly half of all inmates are released in any give year. In recent decades, admissions have consistently exceeded releases, resulting in sustained increases in incarceration rates.

To broadly characterize the policy and behavioral forces driving the increases in Figure 1, I present a simple model of equilibrium incarceration rates as a function of the crime rate and various aspects of sentencing policy that will permit a simple decomposition of the overall change in incarceration rates. Specifically, let c_{it} be the number of crimes per capita of type i ($i=1, \dots, I$) committed in year t and let p_{it} be the corresponding number of prison admissions per crime committed. The latter parameter measures the incarceration risk per criminal act. Let θ_{it} be the proportion of prison inmates incarcerated at the beginning of year t for commission of crime i who are released over the course of the year.

The probability that a non-incarcerated person is sent to prison in year t for committing crime i is given by $c_{it}p_{it}$, while the proportion flowing into prison for this crime is given by one minus the beginning-of-period overall incarceration rate times this transition probability. The proportion of the population convicted of this crime that is flowing out of prison over a year is the starting incarceration rate for crime i multiplied by the release rate θ_{it} . The average release rate also provides a proxy measure for the amount of time that the typical inmate serves on a given spell in prison. The higher the release rate, the lower the average time served. A simple approximation is that the average time served is equal to one divided by the release rate.² Thus, a release rate of 0.5 corresponds to an average time served of two years while a release rate of 0.33 corresponds to an average time served of three years.

² This approximation would be exact when the distribution of actual time served follows an exponential distribution.

In the steady states, the equilibrium incarceration rate for committing crime i equals the transition probability for the flow rate into prison divided by the sum of the admissions and release rate transition probabilities, or

(1)

$$Inc_{it} = \frac{c_{it} P_{it}}{c_{it} P_{it} + \theta_{it}}.$$

In practice, the proportion flowing into prison for a given crime will be a very small number while the release rate θ will be relatively large. Thus approximating the denominator by $1/\theta$ and making use of our approximation of time served, the incarceration rate for crime i can be rewritten as

(2)

$$Inc_{it} = E(T_{it}) c_{it} P_{it}$$

where $E(T_{it})$ is the expected value of time served for the crime. Finally, the overall incarceration rate is derived from the individual crime incarceration rates by summing over i , giving

(3)

$$Inc_{.t} = \sum_i E(T_{it}) c_{it} P_{it}$$

Equation (3) provides a simple accounting identity that is helpful in thinking through the potential sources of the patterns in Figure 1. Assuming that crimes are homogeneous within categories i , there are three potential sources of increase in the incarceration rate, two of which are determined by policy and one by behavior. Beginning with the policy determinants, increases in the expected value of time served for any or all of the crimes will increase the steady state incarceration rate. Thus, sentence enhancements, truth-in-sentencing policies that dictate that inmates must serve larger fractions of their maximum sentences, or changes to parole policy that lowers the release probability conditional on time served will all increase incarceration rates

through $E(T_{it})$. Indeed, the 1980s and 1990 witnessed many such changes to state as well as federal sentencing policy, and thus such an expansion of the incarceration rate along the intensive margin is certainly important (Raphael and Stoll 2007).

Second, increases in the likelihood that the commission of a given crime results in a prison admission will also increase the incarceration rate. Here, more intensive policing, increases in arrest rates, and a greater propensity to punish a given crime with incarceration will all increase the incarceration rate through the values of p_{it} . Simple comparisons of prison admissions per crime suggest that enforcement policy as well as prosecutorial and sentencing policy have shifted decisively towards generating more admissions per crime committed, or alternatively stated, towards a notable expansion of the incarceration rate along the extensive margin.

Finally, changes in criminal behavior operating through the crime rate will impact the overall incarceration rate. Since the late 1970s, there have been several changes in the United States that have likely altered the distribution of the behavioral predisposition of U.S. residents towards criminal activity. For example, changing demographics and levels of education attainment (tending towards less criminal activity), declining earnings prospects at the bottom of the earnings distribution (tending towards more crime), the continued deinstitutionalization of the mentally ill (tending towards more crime), as well as the introduction and diffusion of crack cocaine and crystal methane (tending towards more crime) have all occurred over the last three decades.

A simple method for decomposing the change in incarceration rates between two periods into a component attributable to policy change and a component attributable to behavioral change is as follows. Define time periods $t = 0$ and $t = 1$ over which the expected time served

parameters as well as the admissions per crime parameters all increase. Define the counterfactual crime rates, c_{i1}^* (for $i=1, \dots, I$) as the crime rates that would have occurred in period 1 had the policy parameters not changed between periods 0 and 1. These counterfactual crime rates will deviate from actual crime rate in period 1 due to the fact that under period 0 sentencing parameters, the incarceration rate would be lower. A lower incarceration rate translates into smaller deterrence and incapacitation effects of prison on crime.

The change in the overall incarceration rate over this time period is given by

$$(4) \quad Inc_{.1} - Inc_{.0} = \sum_i E(T_{i1})c_{i1}p_{i1} - \sum_i E(T_{i0})c_{i0}p_{i0}$$

The counterfactual incarceration rate that would have occurred had the policy parameters not changed is given by

$$(5) \quad Inc_{.*} = \sum_i E(T_{i0})c_{i*}p_{i0},$$

where the counterfactual crime rates for crime i are multiplied by the corresponding spell length and admissions probability for year zero and then summed over all crimes. Adding and subtracting (5) to the right hand side of (4) gives the final decomposition

$$(6) \quad Inc_{.1} - Inc_{.0} = (Inc_{.1} - Inc_{.*}) - (Inc_{.*} - Inc_{.0})$$

The first term on the right hand side of (6) provides the extent to which the changing policy parameters increases the incarceration rate above and beyond the counterfactual change that would have occurred regardless. The second component displays what would have been observed had policy remained constant. Thus, the first term provides the estimate of the

contribution of changes in criminal justice policy while the second term provides the contribution of changes in criminal behavior.

Trends in the behavioral and policy determinants of Incarceration Rates

Table 1 provides estimates of all of the needed elements to calculate the steady state incarceration rates in equations (3) through (5) and the decomposition in equation (6). The first two columns present estimates of the time that an inmate admitted in either 1984 or 2002 can expect to serve on the given admission by reason for admission. These numbers come from synthetic cohort estimates of the time-served distributions for inmates admitted in 1984 and 1998 presented in Raphael and Stoll (2007).³ Over the time period analyzed, there are notable increases in the expected value of time served for all categories, on the order of 30 percent, but as high as 50 percent for larceny and other violent offenses, 64 percent for other property offenses, and nearly 80 percent for sexual assault. Even for inmates admitted for a parole violation (those not admitted with a new term for a new offense), average time served increased by 13 percent.

The next two columns present estimates of the number of prison admissions per 100,000 by offense category – i.e., the joint product of the admissions per crime and the crime rate (pc).⁴ With the exception of murder and burglary, there are increases in the overall admissions rate for

³ Raphael and Stoll (2007) use data from the National Corrections Reporting Program to estimate the proportion of inmates admitted in a given year that are then released over subsequent years. To arrive at an expected value of time served, they assume the mid-point for the spell in each time category and impose a fixed conditional expectation for those serving longer than the last defined release year and then calculate an expected value. Since the NCRP represent only 70 percent of admissions (as many states do not consistently report), the averages in Table 1 are normalized so that the overall average incarceration rate equals that implied by one over the release probability for the county as a whole in 1984 and 1998. The table also assumes that after 1998, the time served distribution remained constant. This latter assumption is likely to result in conservative estimates of the average time served, as many sentence enhancement are adopted post 1998.

⁴ I generated these overall admissions rate by first tabulating the distribution of admissions across these categories using the prisoner admissions files from the 1984 and 2002 NCRP data and then distributing total admissions for the states (available from the National Prison Statistics data base) across these categories using these distributions. This imputation assumes that the admissions distribution for states not reporting to the NCRP is similar to the admissions distributions for states that do.

each category. The most notable increases occur for drug crimes (from 7.73 to 43.93 per 100,000) and parole violators (from 20.48 to 80.75 per 100,000). Increases for the remaining categories are more modest yet substantial.

To split these overall admissions rates into crime rates and admissions per crime, one must divide the overall admissions rates by some measure of criminal offending for the two years. For seven of the offense categories listed (murder, rape, robbery, assault, burglary, larceny, and motor vehicle theft), the Federal Bureau of Investigations Uniform Crime Reports (UCR) provide estimates of the number of crimes per 100,000 reported to the police. To measure offending for drug crimes, I use the number of drug arrests per 100,000 for each year.⁵ To measure crime rates for the other violent, other property, and other crime categories, I first estimate the average admissions per crime using the overall admissions rates and the crime rate for the seven offenses with UCR data. I then estimate the admissions per crime rate using the average for the remaining offenses from these seven.⁶ With this estimate, I can then estimate the crime rate for each year by dividing total admissions per 100,000 by the estimated number of prison admissions per crime. A baseline crime rate for parole violations cannot be measured.

The data indicate that crime has been declining for most categories, although there are a few categories with slight increases between 1984 and 2002. The table displays substantial declines in crime rates for murder, rape, robbery, burglary, larceny, motor vehicle theft, and the

⁵ Certainly, the number of drug crimes is much greater than the number of drug arrests. However, since the incarceration rate depends on the product of the overall admissions rate (given by the crime rate times admissions per crime) this simple imputation will not impact my inference regarding the causes of the changes in the incarceration rate. Regarding the attribution of the entire change in arrests to changes in behavior, this will certainly bias upwards the estimate of the contribution of behavior to incarceration growth. There have been concerted efforts to step up enforcement of drug laws and to punish more severely drug offenders.

⁶ For other violent crimes, I estimate the admissions per crime variable using the average admission per crime values for non-homicide violent crime, using the composition of prison admits for that year as weights. For other property crime, I use the average of the admissions/crimes ratio for larceny and motor vehicle theft. For other crimes, I use the overall average admissions/crime ratio weighted by the proportional distribution of admits in each year for the seven offenses with observable crime rates.

other property crime variables. The notable exception is for drug crimes, where drug arrests increase by nearly 80 percent. By contrast, the number of prison admissions per crime (my estimates of p_{it}) increase uniformly over the time period.

The sizable increases in the expected values of time served as well as the increases in the admissions/crime ratio indicate that sentencing and enforcement policy are key driving forces behind the increasing incarceration rates displayed in Figure 1. To more precisely decompose these changes, however, we need estimates of the counterfactual crime rate that would have occurred had the policy parameters remained constant since 1984. To construct these counterfactual crime rates, I use the average estimates from Johnson and Raphael (2007) of the number of crimes prevented per prisoner incarcerated (the joint incapacitation and deterrence effects) to calculate what these crime rates would have been under this counterfactual scenario. To do so, I calculated the disparity between the incarceration rate in 2002 and 1984 and multiply this difference by estimates of the number of crime per 100,000 prevented by incarcerating the average inmate. I then add this hypothetical prevented crime total to the base crime in 2002. These numbers should be thought of as what the crime rate would be in 2002 were policy makers to reduce the incarceration rate to 1984 levels.⁷ For drug crimes, I simply use the observed arrest rate as the counterfactual path.⁸

The counterfactual crime rates in Table 1 suggest that had policy not changed, 2002 crime rates would have been closer to the 1984 levels, with some increases and some decreases. In particular, we would have still observed declines in the murder, rape, robbery, burglary, motor

⁷ Again, this should bias my estimates of the change in behavior upwards since any increase in crime would generate some increase in incarceration which would mitigate the added crime of such a prisoner release.

⁸ In addition, since Johnson and Raphael (2007) only provide crime-prevention estimates for the seven offenses in the UCR I apply the proportional change for these offense above the 2002 level to the three offenses that are not included in the UCR (other violent, other property, and other).

vehicle, and other crime rates. However, these declines would have been smaller than what actually occurred.

Decomposing growth in the U.S. incarceration rate into policy and behavioral components

Table 2 presents estimates of the overall steady-state incarceration rate as well as rates by offense category for 1984 and 2002 as well as the counterfactual incarceration rate described by Equation (5) above. The last three rows of the table provide estimates of the overall steady-state incarceration rate, the steady-state incarceration not inclusive of those serving time for parole violations, and the actual incarceration rate for these years. The steady-state model predicts an incarceration rate of 242 per 100,000 in 1984 and 512 per 100,000 in 2002, for a total increase of 270 per 100,000. Relative to actual incarceration rates, the steady state over-predicts (more so in the early year relative to the latter). These over-predictions are due to the fact the actual incarceration rates in each year deviate from their equilibrium rates, due to the multi-year adjustment process of the incarceration rate to shocks to underlying transition probabilities.⁹ The predicted change in incarceration rates of 270 per 100,000 is quite close to the actual change of 295. Thus, using these data to perform the decomposition discussed above, while not entirely accurate, will provide a good ballpark impression of the relative importance of behavior and policy.

The third column in Table 2 presents estimates of the counterfactual incarceration rates by offense and for the overall incarceration rates minus parole violators from equation (5). The numbers suggest that under the sentencing and enforcement parameters of 1984, the 2002 incarceration rate would not have increased appreciably. In fact, for some crime categories there are small predicted declines and little change for many others. Under this counterfactual

⁹ Johnson and Raphael (2007) model this dynamic adjustment process and show that given the typical parameter sizes for prisoner release and admissions rates in the U.S., a typical shock will induce a 4 to 6 years adjustment process between equilibrium.

scenario, the non-parolee incarceration rate is estimated at 247 per 100,000, only 31 higher than the steady state rate of 242 per 100,000 in 1984. Note, as this difference pertains to the behavioral component of the decomposition in equation (6), this simple accounting suggests that no more than 17 percent of the increase in non-parolee incarceration rates is attributable to behavior, with the remaining 83 percent attributable to stiffer, more punitive policy. Moreover, this 17 percent estimate is likely to be an upper bound, since we have attributed all of the increase in drug arrest to behavior and since the imputation of the counterfactual crime rate was done in a manner likely to over-estimate these rates.

Incorporating parole into this analysis would likely yield an even lower role for behavior. The population of parolees increases with the overall prison population, since larger prison populations yield larger annual release flows to parole. Moreover, parolees are under quite close scrutiny relative to the surveillance they would be under if they were unconditionally released from correctional supervision. Thus, large parole populations tend to generate large inflows back into prison of those who violate the terms of their parole but who do not commit a new felony offense. A simple estimate of the effect of the non-parole incarceration rate on the parole incarceration rate would be to take the ratio of the change in latter to the former. Doing so yields an estimate of a 0.5 unit increase in parole incarceration for each 1 unit increase in the non-parole incarceration rate, and gives an overall increase in the parole incarceration rate equal to 17 percent of the actual increase. Of course, this assumes that parole policies have not changed with regards to their punitive content, an assumption that is likely incorrect (Petersilia 2003). To the extent that parole return policy has become more punitive (in the sense that parolees are violated and returned to custody today for infraction that would have not resulted so in the past), the counterfactual parole increase would be lower as would the relative contribution of behavior.

To summarize, while there is some evidence of a small effect of change in behavior on U.S. incarceration rates, so many Americans are in currently prison because through our collective public choices regarding sentencing and punishment we have decided to place so many Americans in prison. For those who would have been sentenced to prison in past years, we have increased the amount of time that such offenders will serve. For many other less serious offenders, we now punish with a spell in prison many who in the past would have received an alternative, less punitive sanction. Collectively, these changes in who goes to prison (expansion along the extensive margin) and for how long (expansion along the intensive margin) explain roughly 83 percent of the increase in incarceration rates over the last few decades. Thus the characterization by William Spelman (2000) of the doubling of the prison population between the mid 1970s and 1980s and then doubling once more through the end of the century as one of the largest *policy* experiments of the 20th century is indeed correct.

3. What is the Incidence of the Increase in Incarceration Rates?

The increasing incarceration rate does not reflect a general increase in the likelihood of becoming incarcerated, but a concentrated increase in the incarceration risk for well defined sub-segments of the population. First, while incarceration rates have rising for both genders, the overwhelming share of these increases is accounted for by increasing rates for men (Raphael and Stoll 2007). This is not surprising considering that men consistently account for over 90 percent of the incarcerated population in current and past decades. Within the adult male population however, the increase in incarceration risk has been further concentrated among relatively young men (ages 25 to 40) and minority men (black men in particular).

Tables 3 through 5 demonstrate how the likelihood of incarceration has changed for adult males by race, level of educational attainment, and age. The figures in the table are based on tabulations of the 1980 and 2000 Public Use Microdata Samples (PUMS) of the U.S. Census of Population and Housing. The decennial census enumerates both the institutionalized as well as the non-institutionalized population. Within the institutionalized population, one can separately identify individuals residing in non-military institutions. This category includes inmates of federal and state prisons, local jail inmates, residents of inpatient mental hospitals, and residents of other non-aged institutions. I use residence in a non-military institution as the principal indicator of incarceration. In previous research (Raphael 2005), I have demonstrated that estimates of the incarcerated population based on residents in non-military group quarters in the census are quite close to incarceration totals from alternative sources.¹⁰

Each table presents the proportion of the respective population that is engaged in a productive activity (either employed, in school, or in the military), the proportion that is not-institutionalized but idle (not employed, not in school, not in the military), and the proportion institutionalized. All figures pertain to men 18 to 55 years of age. Table 3 presents overall estimates for men for four mutually-exclusive race/ethnicity groupings. The proportion incarcerated increased for all groups of men between 1980 and 2000. However, the absolute increase is largest for non-Hispanic black men and Hispanic men. The 2000 census indicates that roughly nine percent of the adult black male population was incarcerated on any given day.

¹⁰ To gauge the validity of using the census data in this manner, in previous research (Raphael 2005) I compare estimates of the institutionalized population from the census to estimates of the incarcerated populations from other sources by race. While the census estimates are slightly larger than estimates of the incarcerated population from the Bureau of Justice Statistics, the disparities are quite small relative to the overall incarcerated population. The difference likely reflects the very small remaining inpatient population in U.S. mental hospitals.

The comparable figures for other groups are three percent for Hispanics, 1.4 percent for whites, and 0.6 percent for Asians.

Table 4 reveals that the proportion incarcerated has increased the most for the least educated men, and that this education-incarceration relationship differs substantially across racial groups. Among white men in 2000, those without a high school diploma are more than twice as likely to be institutionalized relative to those with a high school degree, with 4.5 percent of the former and approximately two percent of the latter institutionalized in 2000. Moreover, white male high school dropouts experienced the largest increase in institutionalization rates between 1980 and 2000 (2.4 percentage point change, compared with a 1.3 percentage point increase for white high school graduates, and a 0.4 percentage point increase for those with some college education).

These changes as well as the levels are small in comparison to what is observed for black men. Between 1980 and 2000, the proportion of black men with less than a high school degree that is institutionalized on any given day increases from 0.057 to 0.206. For black male high school graduates, the proportion institutionalized increases from 0.027 to 0.087. Even among black men with some college education, the incarceration increases by over two percentage points. In fact, the changes observed among this group of black men are comparable in magnitude to the changes observed among white high school dropouts.

By comparison, the changes in institutionalization rates among Asian men are small, as are the changes among Hispanic men. The relatively low institutionalization rates among Hispanic men are consistent with recent research by Butcher and Piehl (2006) demonstrating the relatively low levels of incarceration among recent immigrants (levels that are particularly surprising given the much lower levels of educational attainment).

Table 5 parses the data further for the least educated by age. For high school dropouts and those with a high school diploma, the table presents the distribution of each group across the three possible states by race/ethnicity and by three age groups (18 to 25 years of age, 26 to 35, and 36 to 45). While not true in all instances, the proportion institutionalized is greatest for men between 26 and 35 within each education/race group. The most startling figures are those for black men in 2000. Among black men, roughly one third of high school dropouts between 26 and 35 are incarcerated on a given day, a number comparable to the proportion of this sub-group employed. The comparable figure for black men with a high school degree is approximately 23 percent. More generally, the institutionalization rate increases for all of these sub-groups of less educated young men. However, the patterns for black males are particularly severe.

The patterns depicted in Tables 3 through 5 are conservative estimates of the changes in incarceration for these groups, given that I am limited to data from the 2000 census. Since the time period when the data underlying the PUMS was last collected (approximately April 1999), the prison and jail populations have continued to grow, albeit at a slower rate. Between 1999 and 2006, the point-in-time prison population increased by roughly 270,000 inmates (a 20 percent increase) while over the same period the local jail population increased by 160,000 inmates (a 26 percent increase). By contrast, the U.S. population grew by roughly 8 percent over this time period. Thus it is likely that the 2010 census will reveal even more stark patterns.

In addition, Tables 3 through 5 pertain only to the proportion incarcerated on a given day. Another relevant set of figures for understanding the importance of a prior incarceration in impacting self-sufficiency is the proportion of men who have ever served time. Given the high turnover in U.S. prisons discussed above, the drastic increases in incarceration rates experienced over the last three decades has left in its wake an increasingly large population of former

inmates. The Bureau of Justice Statistics estimates that approximately 3 percent of white male adults, 16 percent of black male adults, and 8 percent of Hispanic male adults have served prison time at some point in their lives (Bonczar 2003). In an analysis of administrative records from the California Department of Corrections, I have estimate that at the close of the 1990s, over 90 percent of black male high-school dropouts, and 10 to 15 percent of black male high school graduates have served prison time in the state. Pettit and Western (2004) estimate that for all African American men born between 1965 and 1969 the proportion who have been to prison by 1999 was 20.5 percent for all men, 30.2 percent for black men without a college degree, and 58.9 percent for black men without a high school degree.

Thus, less-educated minority men are considerably more likely to be incarcerated currently than at any time in the past. Moreover, given the fluidity of prison populations, the population of non-institutionalized former inmates has grown continuously and now constitutes sizable minorities, and in some instances majorities, of certain sub-groups of U.S. men.

4. How Does Serving Time Impact One's Employment Prospects?

The discussion of Tables 3 through 5 focused primarily on the changes in incarceration rates occurring between 1980 and 2000. We saw marked increases in the proportion of men incarcerated on any given day for relatively young, less educated, minority men. Conversely, there are corresponding sizable declines in the proportions of men who are active in a productive activity (defined here as in school, employed, or in the military). For example, Table 4 reveals declines in the proportion of black men that are active between 1980 and 2000 of 23 percentage points for high school dropouts, 15 percentage points for high school graduates, and 7 percentage

points for those with some college education. These declines are particularly large for the young and less educated minority men depicted in Table 5.

Figure 2 demonstrates directly the correspondence between the changes in the proportion employed/active and the changes in the proportion incarcerated. The figure plots the ten-year changes in the proportion active for the 1980s and 1990s against the corresponding ten-year changes in the proportion institutionalized for each of the demographic groups defined by the complete interaction of the four race/ethnicity groups and four education attainment groups displayed in Table 4 as well as four age groups corresponding to those used in Table 5 plus the group of men 46 to 55. There is a clear negative correlation between these two variables. The results from a simple bivariate regression suggest that a one percentage point increase in the proportion incarcerated is associated with a 0.83 percentage point decrease in the proportion active. If one were to interpret this coefficient as a causal effect, it would suggest that the 24 percentage point increase in the incarceration rate of male black high school dropouts between 26 and 35 caused an approximate 20 percentage point decline in the employment rate of this group (thus explaining almost 70 percent of the actual decline of 29 percentage points).

What causal pathways may link changes in incarceration rates to the employment outcomes of low-skilled men? First, there is a simple contemporaneous mechanical incapacitation effect of incarceration, in that institutionalized men cannot be employed in the conventional sense. If one were to randomly select a group of men and incarcerate them, the slope coefficient from a regression of the change in employment on the change in incarceration should equal the employment rate for men overall. To be sure, those admitted to prison are hardly a random sample of adult men and are likely to have employment rates substantially below that of the average male. Nonetheless, exogenous increases in incarceration will

mechanically reduce the employment rate for those impacted to the extent that some of the newly admitted inmates were employed at the time of arrest.^{11,12}

Beyond this contemporaneous effect, incarceration is also likely to have a dynamic lagged impact on the employment prospects of former inmates as well as a contemporaneous impact on the employment outcomes of men who have not been to prison yet come from demographic sub-groups with high incarceration rates. The dynamic effects are derived from the failure to accumulate human capital while incarcerated as well as the stigmatizing effects (sometimes exacerbated by state and federal policy) associated with a prior felony conviction and incarceration. The alternative contemporaneous effect results from employers statistically discriminating against men from high incarceration demographic groups in an attempt to avoid hiring ex-offenders.

Incarceration and the accumulation of work experience

Serving time interrupts one's work career. The extent of this interruption depends on both the expected amount of time served on a typical term as well as the likelihood of serving subsequent prison terms. The average prisoner admitted during the late 1990s on a new commitment faced a maximum sentence of three years and a minimum of one year, with many

¹¹ A number of studies demonstrate that roughly one to two-thirds of inmates are employed at the time of the arrest leading to their current incarceration (See Kling 2006, Petit and Lyons 2007, Tyler and Kling 2007, and Sabol 2007.

¹² To be sure, causality may also run in the reverse direction – i.e., from declining employment prospects, to criminal activity, to incarceration. However, the evidence on this front is rather weak. First, the decline in wages of the least skilled men between 1980 and 2000 was heavily concentrated in the 1980s, with some low-skilled men regaining lost ground during the 90s and beyond. However, the increase in incarceration during the 90s was equal in magnitude to the increase occurring during the 1980s, and the incarceration rate continued to increase between 2000 and 2006. Second, evidence of a behavioral increase in criminal activity is scant, with most research suggesting that the propensity to commit crime actually declined during the 1990s even after accounting for the increase in incarceration.

-serving time around the mid point of this range (Raphael and Stoll 2005). If this were the only time served for most, then the time interruption of prison would not be that substantial.¹³

However, many people serve multiple terms in prison, either due to the commission of new felonies or due to violation of parole conditions post-release. A large body of criminological research consistently finds that nearly two thirds of ex-inmates are rearrested within a few years of release from prison (Petersilia 2003). Moreover, a sizable majority of the re-arrested will serve subsequent prison terms. Thus, for many offenders, the typical experience between the ages of 18 and 30 is characterized by multiple short prison spells with intermittent, and relatively short, spells outside of prison.

In prior longitudinal research on young offenders entering the California state prison system, I documented the degree to which prison interrupts the early potential work careers of young men. I followed a cohort of young men entering the state prison system in 1990 and gauged the amount of time served over the subsequent decade (Raphael 2005). This analysis is documented in Table 6. Panel A shows that the median inmate serves 2.8 years of cumulative time during the 1990s, with the median white inmate (3.09 years) and median black inmate (3.53 years) serving more time and the median Hispanic inmate (2.23 years) serving less time.¹⁴ Roughly 25 percent served at least 5 years during the 1990s while another 25 percent served less than 1.5 years.

However, as a gauge of the extent of the temporal interruption, these figures are misleading. Cumulative time served does not account for the short periods of time between prison spells where inmates may find employment, yet are not able to solidify the employment

¹³ Of course, I am not saying that a year in prison is not costly. However, a year absence from the labor market during the beginning of one's career would have only a small effect on accumulated experience.

¹⁴ The California inmate population is roughly evenly distributed between whites, Hispanics, and Blacks and is overwhelmingly male.

match with any measurable amount of job tenure. A more appropriate measure of the degree to which incarceration impedes experience accumulation would be the time between the date of admission to prison for the first term served and the date of release from the last term.

Using time lapsed between first admission and final release during the 1990s, the figures in Panel B show that five years elapses between the first date of admission and the last date of release for the median inmate. For median white, black, and Hispanic inmates, the comparable figures are 6.2, 6.5, and 3.2 years, respectively. For approximately one quarter of inmates, nine years pass between their initial commission to prison and their last release. In other words, one quarter of these inmates spend almost the entire decade cycling in and out of prison.

Spending five years of one's early life (6.5 years for the median black offender) cycling in and out of institutions must impact one's earnings prospects. Clearly, being behind bars and the short spans of time outside of prison prohibits the accumulation of job experiences during a period of one's life when the returns to experience are the greatest.

Does having been in prison stigmatize ex-offenders?

The potential impact of serving time on future labor market prospects extends beyond the failure to accumulate work experience. Employers are averse to hiring former prison inmates and often use formal and informal screening tools to weed ex-offenders out of the applicant pool. Given the high proportion of low-skilled men with prison time on their criminal history records, such employer sentiments and screening practices represent an increasingly important employment barrier, especially for low-skilled African-American men.

Employers consider criminal history records when screening job applicants for a number of reasons. For starters, certain occupations are closed to felons under local, state, and in some instances, federal law (Hahn 1991). In many states employers can be held liable for the criminal

actions of their employees. Under the theory of negligent hiring, employers can be required to pay punitive damages as well as damages for loss, pain, and suffering for acts committed by an employee on the job (Craig 1987). Finally, employers looking to fill jobs where employee monitoring is imperfect may place a premium on trustworthiness and screen accordingly.

In all known employer surveys where employers are asked about their willingness to hire ex-offenders, employer responses reveal a strong aversion to hiring applicants with criminal history records (Holzer, Raphael, and Stoll 2006, 2007; Pager 2003). For example, Figure 3 displays employer responses to a question inquiring about employer willingness to hire ex-offenders from the 1993/1994 Multi-City Study of Urban Inequality. Over 60 percent of employers indicated that they would “probably not” or “definitely not” hire applicants with criminal history records, with “probably not” being the modal response. By contrast, only eight percent responded similarly when queried about their willingness to hire current and former welfare recipients.

The ability of employers to act on an aversion to ex-offenders, and the nature of the action in terms of hiring and screening behavior, will depend on employer accessibility to criminal history record information. If an employer can and does access criminal history records, the employer may simply screen out applicants based on their actual arrest and conviction records. In the absence of a formal background check, an employer may act on their aversion to hiring ex-offenders using perceived correlates of previous incarceration, such as age, race, or level of educational attainment to attempt to screen out those with criminal histories. In other words, employers may statistically profile applicants and avoid hiring those from demographic groups with high rates of involvement in the criminal justice system.

Such propensity to statistically discriminate is evident in the interaction effect of employers' stated preference regarding their willingness to hire ex-offenders, their screening behavior on this dimension, and their propensity to hire workers from high incarceration rate groups. This relationship is illustrated in Figure 4, which reproduces some of the key findings in Holzer, Raphael and Stoll (2006). The figure presents tabulations of employer survey data collected in 1993/1994 pertaining to the proportion of employers whose most recent hire is a black male by their self-reported willingness to hire ex-offenders interacted with a self-report regarding whether the employer uses criminal history background checks in screening their potential employees. Among employers who indicate that they are willing to hire ex-offenders, there is no statistically discernable difference in the proportion of recent hires who are black men between those who check and those who do not check criminal backgrounds. Among employers who indicate that they are unwilling to hire ex-offenders, however, checking criminal background is associated with 5.6 percentage point increase in the likelihood that the most recent hire is a black male (statistically significant at the 5 percent level).¹⁵ Thus, among those most averse to hiring former inmates, checking backgrounds actually increases the likelihood that the firm hires black males. This patterns indicates that in the absence of such objective screening methods, employers use more informal screening tools (such as not hiring black males) to weed out potential former inmates. Holzer, Raphael and Stoll (2006) find similar patterns with regards to employer willingness to hire other stigmatized groups of workers, such as those with large unaccounted for gaps in their employment histories.

With regards to the direct effect of stigma on former inmates themselves, the audit study by Pager (2003) offers perhaps the clearest evidence of employer aversion to ex-offenders and

¹⁵ The 4.4 percentage point difference relative to firms who are willing to hire black males is statistically significant at the 10 percent level of confidence.

the stigma associated with having served time in prison. The study uses male auditors matched on observable characteristics including age, education, general appearance, demeanor, and race, to assess the effects of prior prison experience on the likelihood that each auditor is called back for an interview. The author finds consistently sizable negative effects of prior prison experience on the likelihood of being called back by the employer, with callback rates for the auditor with prior prison time one half that of the matched co-auditor.¹⁶

Existing Research on the Employment Consequences of Incarceration

In conjunction, the effects of stigma combined with the impact of incarceration on human capital accumulation, and perhaps depreciation, suggest that serving time is likely to adversely impact one's employment prospects. Moreover, for men from high incarceration sub-groups, the high rate of involvement with the criminal justice system may have a negative spillover effect to the extent that employers wish to screen out ex-offenders and do so using informal perceived signals of criminality such as race, or gaps in one's employment history.

A growing body of empirical research investigates the effects of being convicted and serving time on post release employment and earnings. In nearly all of these studies, researchers analyze the pre-post incarceration path of earnings and employment of those who serve time. To be sure, the principal empirical challenge in this research is to define the counterfactual path of earnings and employment for those who go to prison. Defining such a counterfactual path is considerably difficult considering that (1) men tend to go prison during a time in their lives

¹⁶ Of course, the audit evidence is subject to the critique that the demonstration of the existence of employers who discriminate against former inmates does not necessarily imply a market-level effect of this discrimination. Former inmates can adjust their supply behavior by applying only to those firms willing to hire them. To the extent that the latter set of employers is large relative to the unwilling-to-hire group, the ultimate impact on employment and earnings may be negligible. However, Holzer, Raphael, and Stoll (2007) find that fairly large proportions of employers express reservations about hiring former inmates. Moreover, in labor market models with search frictions, such unwillingness may reduce the job offer arrival rate of former inmates, resulting in greater unemployment, lower wages when employed (to the extent that former inmates lower their reservation wage), and a higher proportion withdrawing from the workforce.

(early to mid 20s) when labor force attachment and earnings are changing rapidly, and (2) those who serve time are quite different from those who do not, both on observable and unobservable dimensions.

The challenges to this line of research are illustrated in Figures 5 and 6. To construct these figures, I identified all young men in the 1979 National Longitudinal Survey of Youth (NLSY79) who were interviewed while incarcerated (the principal gauge of serving time in these data) for the first time at the age of 23 or later. I then matched each of these youth to one non-incarcerated male in the sample, defined as youth who never do time during the period covered by the NLSY79. In choosing matches, I identified all never-incarcerated youth who match each incarcerated youth exactly on age, region of residence in the country, education at 22 years of age, and race. From these exact matches, I then chose either the match with the closest Armed Forced Qualifying Test (AFQT) score when the AFQT was available for the incarcerated youth, or a random match (among those who exact matched on observable dimensions) for incarcerated youth with no AFQT score. Each figure presents the mean of an outcome for the group of incarcerated youth or the never-incarcerated youth for years relative to the year of first incarceration ($t=0$). The figure compares outcomes for the five years preceding incarceration as well as the subsequent eight-year period.

Figure 5 compares annual weeks worked. During the pre-incarceration period, average weeks worked among future inmates and the never incarcerated are both increasing (by 5.5 weeks among future inmates and by 8 weeks among the comparison youth). At the point of first incarceration, however, the two series diverge sharply. Among the never incarcerated, average weeks worked continues to increase from approximately 33 weeks at year zero to 40 weeks at year five (followed by a decline in employment corresponding to the early 90s recession).

Among the incarcerated, there is a sharp drop in weeks worked in the first survey year following the year of first observed incarceration (to 11 weeks). The pre-incarceration peak of 22 weeks is recovered five years post incarceration, but does not rise above the pre-incarceration level during the latter eight-year period. The departure between the incarcerated and comparison groups is illustrated by the difference in mean weeks worked during the pre-incarceration period and the post incarceration period. For the five pre-incarceration years, the never-incarcerated work roughly 9.5 more weeks per year than the group of future inmates. In the eight post-incarceration years, this average difference increases to 17.4 weeks.

Figure 6 shows similar patterns for average annual earnings. During the pre-incarceration period, the ratio of annual earnings for the comparison sample to the incarcerated sample is roughly 1.5. During the post-incarceration period, this ratio increases to an average of 2.6.

These two figures both illustrate the difficulties faced by research on this topic. As is evident from the employment and earnings path of the treatment group, incarceration occurs at a point in the age-earnings profile of young men where labor force attachment is strengthening and annual earnings are increasing. Simple before-after comparisons of earnings and employment among those who experience incarceration will under-estimate the true consequences of having served time to the extent that earnings and employment would have grown through this period in the absence of an incarceration spell.

The figure also reveals the large base-disparities between those who eventually serve time and those who don't even after having matched on a number of demographic and human capital dimensions. The comparison sample works nine more weeks and earns 50 percent more than the sample of future inmates even before the first incarceration spell. Thus, while pre-

incarceration employment and earnings dynamics are similar, this large pre-treatment disparity in average outcomes raises questions about whether the post-incarceration employment and earnings paths of non-inmates provide accurate counterfactuals for those who serve time.

Several researchers have employed a host of strategies to address these methodological challenges using data from the NLS79. To estimate the effect of previous incarceration on wages, Western (2002) uses the NLSY79 data to estimate a series of panel regression fixed-effect models where the analysis sample is restricted to those who serve time as well as the additional sub-sample of youth in the NLSY who are at high risk of incarceration as indicated by their self-described involvement in criminal activity. By limiting the study to high-risk youth, Western was able to show that it was not other factors, such as education or income, because all the youth, by being “high risk,” shared these attributes to a certain degree. Western finds a sizable relative decline in the hourly wages of formerly incarcerated high-risk youth relative to those who did not serve time.

In previous research (Raphael 2007), I also employ panel regressions to estimate the effect of a previous incarceration spell on current annual weeks worked, after accounting for current incarceration, the effect of other time-varying covariates, and person-specific fixed effects. The principal empirical innovation in this study is to restrict the analysis sample to youth who eventually serve time. This restriction thus uses youth who serve time later in life as a control group for youth who serve time earlier. I find a significant negative effect of prior incarceration on prior weeks worked on the order of 5 to 6 weeks.

Sweeten and Apel (2007) uses data from the more recent NLSY97 to estimate the effects of a prior incarceration spell on various employment, educational, and criminal justice outcomes using a methodological framework similar to those described in the construction of Figures 5 and

6. Specifically, using propensity score matching and a large set of covariates, the authors identify comparison samples for youth who are first incarcerated at 16 to 17 years of age and youth who are first incarcerated at 18 to 19 years of age and then compare the average outcomes for their treatment and comparison groups for a pre-incarceration year, the year of first incarceration, and the five post-incarceration years. The authors are able to closely match the treated group with good balance on observable covariates and quite comparable pre-incarceration outcomes for the treatment and comparison samples. The authors find sizable effects of a previous incarceration on the probability of employment five years following. The authors also find some evidence that a prior incarceration predicts future criminal activity and poorer post-incarceration educational attainment outcomes relative to the matched comparison sample.

A number of studies have used administrative data on arrest and incarceration matched to administrative earnings records to estimate the effects of involvement in the criminal justice system on employment outcomes. Waldfogel (1994) and Grogger (1995) are among the first to pursue this research strategy. Waldfogel uses data on people who are convicted in federal court and compares pre and post conviction employment outcomes culled from federal parole records. The author tests for differential effects of actually serving time and of being convicted of a crime involving a breach of trust. The largest earnings penalties occur for those who serve time and those convicted of a “breach” crime. The author also provides evidence that the negative effects of conviction and incarceration on earnings are largest for more educated former inmates.

Grogger (1995) uses California administrative data to study the distributed lagged effect of arrest, conviction, probation, being sentenced to jail, and being sentenced to prison on subsequent earnings and employment using rap sheet information provided by the state attorney general’s office and earnings information from state ES-202 records. Using a series of fixed

effect models, the author finds that arrest has a short lived negative effect on earnings, while serving a prison sentence has a more pronounced and longer-lasting negative effect on earnings. Regarding the latter finding, Grogger cannot assess whether this is a mechanical incapacitation effect of being incarcerated.

A number of recent studies have used state and federal prison administrative records combined with ES-202 earnings records to analyze the pre and post employment and earnings patterns of prison inmates. For example, Kling (2006) analyzes data for federal prisoners in California and state prisoners in Florida, Jung (2007) and Cho and Lalonde (2005) analyze data for state prisoners in Illinois, Petit and Lyons (2007) analyze data for prisoners in Washington state, while Sabol (2007) analyzes data for prisoners in Ohio. While these studies differ from one another in terms of the exact questions asked of the data and the methodological approach taken, there are several consistent findings across states.

First, the ES-202 records reveal extremely low levels of labor force participation and earnings among state-prison inmates prior to incarceration (with roughly one-third showing positive quarterly earnings in a given quarter for the two years period preceding incarceration). Kling (2006) is the only study that compares employment as measured by quarterly earnings records to inmate self-reported employment at the time of arrest. The author reports that while only 33 percent of inmates have positive earnings in the typical pre-incarceration quarter, nearly 65 percent report being employed at the time of arrest. Based on analysis of CPS data for comparable men, Kling concludes that most of this disparity reflects the fact that inmates are employed in informal jobs where employers are not paying social security taxes or paying into the UI system.

Second, nearly all of the studies find that employment increases above pre-incarceration levels immediately following release and then declines to pre-incarceration levels or falls below pre-incarceration levels within a couple of years. The small post-release employment increase is likely driven by the fact that most released prisoners are conditionally released to parole authorities and must meet certain obligations, including employment search or even employment requirements, to remain in the community. To the extent that parole increases employment, or that parole increases the likelihood of being employed in a formal sector job that shows up in quarterly UI records, the post-released increase may be explained by the effect of post-release supervision.

Third, several studies (Cho and Lalonde 2005, Kling 2006, Jung 2007) find that the post-release increase in employment is larger for inmates who serve longer terms. However, Kling (2006) shows that this disparity does not survive controlling for differences in inmates characteristics and program participation differences between inmates serving shorter and longer terms. Particularly important are difference in the propensity to be involved with a work-release program at the time of the release from prison.¹⁷

While these studies are suggestive of the impact of conditional supervision on employment, they are generally unable to identify the effects of incarceration on the age-earnings and age-employment profiles of those who serve time. The reliance on quarterly UI records renders these results particularly sensitive to any factors that are likely to impact the probability of working for an employer that complies with labor market regulations. It seems reasonable to assume that the employers who participate in work-release programs or who have working relationships with labor market intermediaries that place former inmates have a high degree of

¹⁷ Describe patterns from the NCRP 2002 releases here.

compliance of workforce regulation. If this is the case, the pre and post incarceration employment outcomes as measured by UI earnings records may not be comparable.¹⁸

In addition, these studies do not identify a comparison group of individuals who do not serve time to whom we could compare the average earnings and employment paths of those who do. As is evident in Figures 5 and 6 above, many young men enter prison at a time when labor force attachment is strengthening and earnings are increasing. Failing to account for the slope of the age-earning profile at the time of incarceration seriously distorts inferences regarding the ultimate impacts of incarceration.

A final group of studies uses data from the U.S. census to estimate the partial correlation between the proportion of a given demographic that is incarcerated and the average employment outcomes of the non-incarcerated among the corresponding group (Raphael 2005, Raphael and Ronconi 2006). These studies show that those demographic sub-groups that experience the largest increases in incarceration rates also experience the largest decreases in employment among the non-incarcerated. To the extent that the change in the incarceration rate is correlated with the change in the proportion of the non-incarcerated in the group that has been to prison, these results are suggestive of a negative effect of incarceration. Raphael (2005) shows that changes in the incarceration rates explains sizable portion of the widening racial disparity in employment rates while Raphael and Ronconi (2006) show the strong covariance between changes in incarceration rates and shifts in the earnings distribution.

¹⁸ Kornfield and Bloom (1999) provide a detailed comparison of earnings as measured by quarterly UI records to survey data earnings as measured in the JTPA training experiments and provide estimated program effects using the two sources of data. The authors show that earnings from the UI data are systematically lower than earnings from the survey records. However, relative program effects are similar in magnitude using the two sources of information. The one exception to this rule, however, is for young men with criminal records. The UI data yield larger program effect estimates than the survey records, suggesting that for this particular group, program participation is increasing the likelihood of working for an employer that complies with reporting and tax requirements.

5. Conclusion

Thus, through a series of policy choices that have increased the amount of time that inmates serve as well as the scope of offenses deemed punishable with a prison term, the U.S. incarceration rate has increased by over 400 percent in the past three decades. While there is some evidence that shifts in behavior contributed to this increase, the role of increased criminal activity among the residents of the U.S. is minor relative to the contribution of policy choices. Moreover, the incidence of this increase has hardly been distributed evenly across the population. Higher incarceration rates have largely impacted less-educated minority men (African-American men in particular) in what would normally be the most active years of their work careers. These men fail to accumulate work experience while incarcerated and face a job market where many employers, especially employers of low-wage workers who interact with the public, are wary of hiring ex-offenders. Not surprisingly, labor force participation rates, employment rates, and earnings among former prison inmates are particularly low.

Presumably, the benefits of the incarceration boom in the U.S. accruing to the non-institutionalized come in the form of reduced crime. Incarceration mechanically incapacitates many criminally active men and the threat of incarceration may deter others from becoming involved with crime to begin with. However, recent research suggests that the size of these crime-abating effects have declined considerably with the large increase in incarceration along the extensive margin. In fact, in my research with Rucker Johnson on this topic, we find that the amount of crime prevented by incarcerating the average prisoner for one year during the 1990s run roughly one quarter the number of crimes avoided by incarcerating the average prisoner during the 1980s. Moreover, simple extrapolation of existing estimate of crime-prison

elasticities indicates that the further increases in incarceration since the late 1990s have probably halved these latter crime prevention effects (Raphael 2007).

The declining crime-fighting effects of incarceration are not too surprising considering that the marginal inmate incarcerated today is considerably less dangerous than the marginal inmate incarcerated in years past. For example, current prison admissions are considerably more likely to be admitted for a drug offense or a parole violation and considerably less likely to be admitted for a violent crime. In addition, the median age of admitted prisoners has increased by roughly five years since 1984 (Raphael and Stoll 2007). Given the strong negative correlations between criminal participation and age, this suggests that along this dimension the marginal prisoner admit is currently less criminally inclined than those in years previous.

While the benefits are declining, the costs are not. Donohue (2007) estimates that the annual cost per prison year runs between \$25,000 and \$50,000 per year, depending on how capital expenditures are treated. It is unlikely that the crime-prevention effects of many of the inmates that we currently incarcerated are sufficient to justify these explicit expenditures. Moreover, there are many, more difficult to price, social costs of incarceration. For example, my research with Rucker Johnson (2007) finds that increases in incarceration have increased the incidence of HIV/AIDS among effected groups of males as well as the females most likely to be their intimates. In particular, we find that much of the disparity in AIDS infection rates between black men and white men as well as between black women and white women is explained by the inter-racial difference in male incarceration rates. The work of Manza and Uggen (2006) have analyzed the effects of incarceration on political outcomes via the common disenfranchisement of those currently serving time and not uncommon lifetime disenfranchisement of former inmates. Charles and Louh (2007) have found that changes in male incarceration rates have had

adverse consequences on the marital outcomes of African-American women, reducing the overall likelihood of being married and the quality of the match conditional on being married. Finally, Johnson (2007) has found substantial evidence in an analysis of the Panel Study of Income Dynamics of parental incarceration on the further material impoverishment of children, child behavioral problems in school, and various measures of juvenile delinquency.

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Figure 1



Figure 2

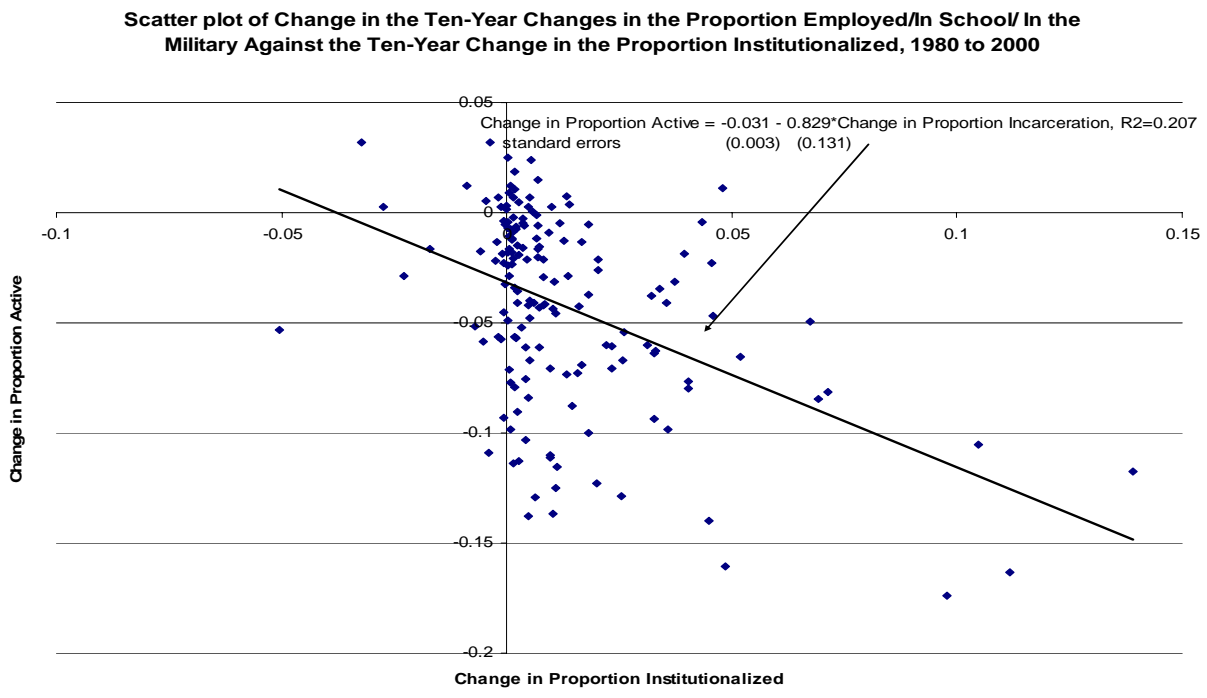


Figure 3

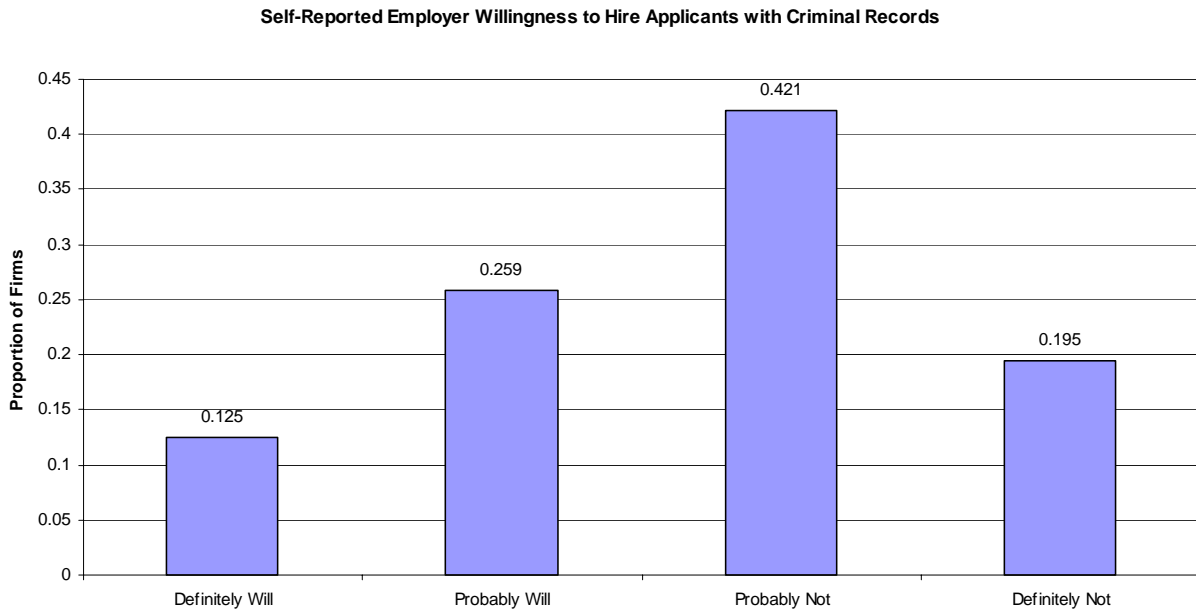


Figure 4

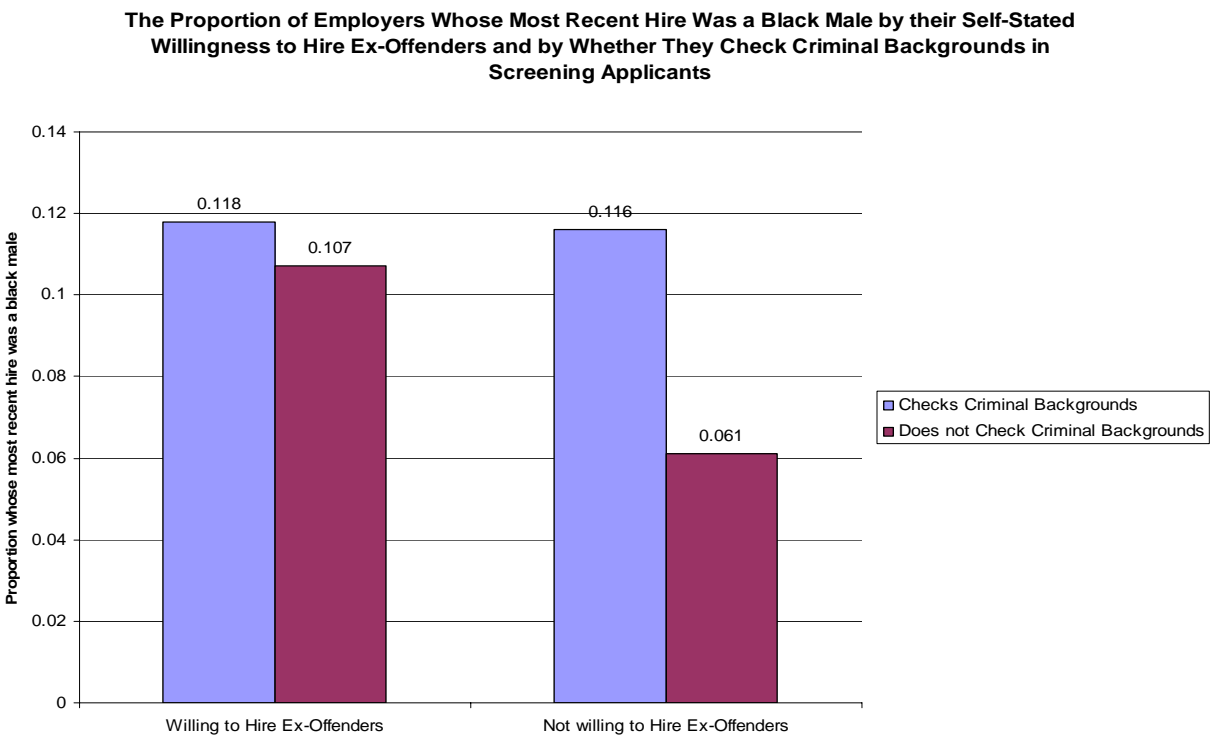


Figure 5

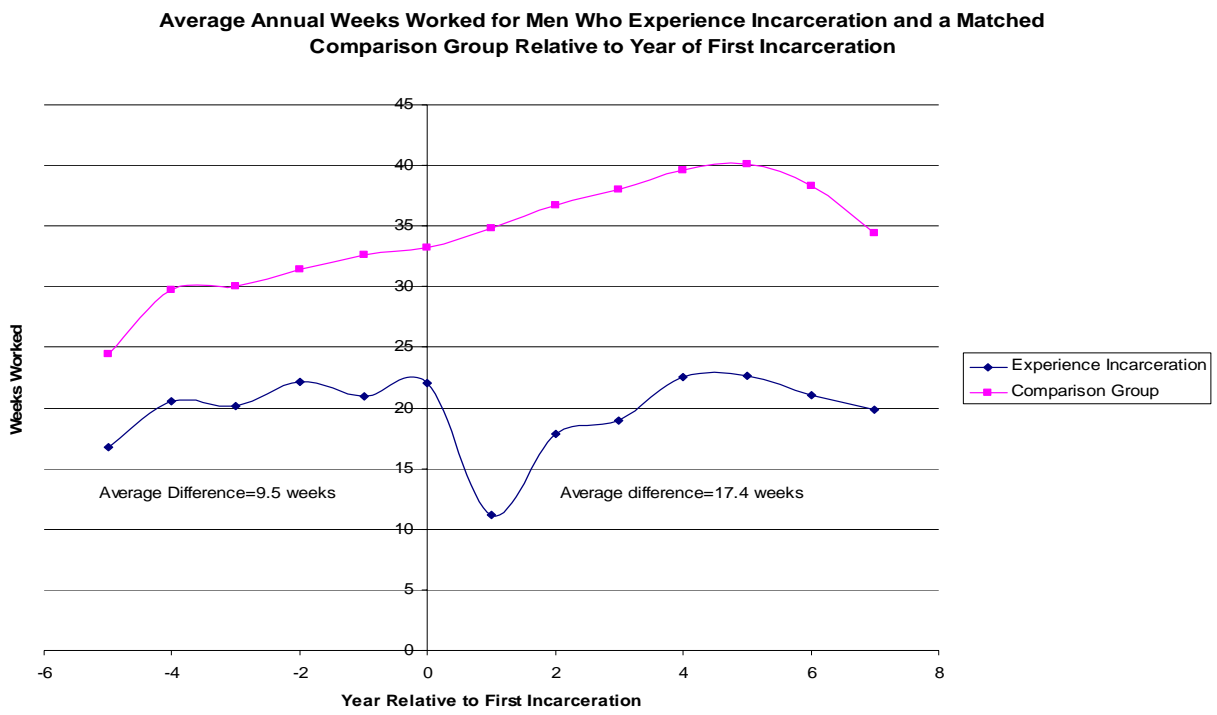


Figure 6



Table 1
Comparison of Expected Time Served, Prison Admission Rates, Incarceration Risk per Crime, and Crime Rates for the United States by Type of Criminal Offense, 1984 and 2002

	Expected Value of Time Served in Years ($E(T)$)		Prison Admissions per 100,000 (pc)		Crime Rate per 100,000 (c)			Prison Admissions per Crime Committed (p)	
	1984	2002	1984	2002	1984	2002	2002 Counter-factual	1984	2002
Murder	6.49	8.13	5.47	4.98	7.92	5.63	6.95	0.69	0.89
Rape	2.98	5.30	4.35	7.70	35.71	33.11	42.01	0.12	0.23
Robbery	3.13	3.80	12.51	9.97	205.44	146.12	207.38	0.06	0.07
Assault	2.01	2.86	5.00	12.03	290.23	309.54	309.50	0.02	0.04
Other violent	2.30	3.47	1.72	3.53	21.34 ^a	35.65 ^a	44.45 ^c	0.06 ^e	0.10 ^e
Burglary	1.99	2.48	19.08	14.21	1263.70	747.22	1,034.25	0.02	0.02
Larceny	1.44	2.17	13.93	17.83	2791.30	2,450.72	2,915.05	0.00	0.01
Mot. veh.	1.42	1.87	0.99	2.79	437.11	432.91	564.38	0.00	0.01
Other prop.	1.52	2.49	3.01	4.98	828.26 ^a	725.46 ^a	904.65 ^c	0.00 ^f	0.01 ^f
Drugs	1.63	2.11	8.73	43.93	264.31 ^b	469.68 ^b	469.68 ^d	0.03	0.09
Other	2.92	2.27	12.45	20.26	138.37 ^a	184.18 ^a	229.67 ^c	0.06 ^g	0.07 ^g
Parole Violators	1.27	1.44	20.48	80.75	-	-	-	-	-

Time served estimates come from Raphael and Stoll (2007). Each value is rescaled so that the expected value of time served is equal to the value implied by the national prison release rate for the year described. Prison admissions rates are estimated by applying the distribution of admissions by offense category estimated from the 1984 and 2002 NCRP files to the overall national admissions rates. Crime rates are based the Uniform Crime Reports unless otherwise noted. Counter-factual crime rates are estimated using crime-specific incapacitation and deterrence effect estimates of incarceration on crime taken from Johnson and Raphael (2007).

a. Crime rate estimates based on imputed admissions per crime and the observed admissions rates

b. Crime rates for drug crimes are equal to the number of adult arrests for drug crimes per 100,000 U.S. residents.

c. Assumes a 25 percent increase in offending above the 2002 level (equal to the 2002 admissions weighted sum of the predicted increase above 2002 for the seven part 1 offenses).

d. Set equal to the arrest rate for 2002.

e. Based on average admissions per crime committed for non-homicide violent crimes by year.

f. Based on average admissions per crime committed for non-burglary property crimes by year.

g. Based on the weighted average admissions per crime for all crimes by year.

Table 2
Estimates Change in Steady State Incarceration Rates, Overall and by Commitment Offense, and Calculation of Counterfactual Incarceration Rates Holding Policy Parameters Constant to 1984 Values

	Implied Steady State Incarceration Rates			Change, 1984 to 2002	
	1984	2002	2002 Counterfactual	Difference, 2002 – 1984	Difference, 2002 Counterfactual - 1984
Murder	35.52	40.43	31.25	4.91	-4.27
Rape	12.98	40.81	15.27	27.84	2.29
Robbery	39.15	37.91	39.52	-1.23	0.38
Assault	10.03	34.36	10.70	24.33	0.67
Other violent	3.97	12.24	6.46	8.27	2.49
Burglary	37.97	35.22	31.08	-2.75	-6.89
Larceny	20.02	38.62	20.90	18.60	0.89
Mot. veh.	1.41	5.22	1.82	3.81	0.41
Other prop.	4.57	12.41	4.99	7.85	0.42
Drugs	14.20	92.58	25.23	78.38	11.03
Other	36.30	45.94	60.26	9.63	23.95
Parole Violators	26.05	116.38	-	90.34	-
Overall or total change in steady state	242.15	512.13	-	269.97	-
Overall or total change in steady state less parole violators	216.11	395.74	247.47	179.63	31.36
Actual Overall Incarceration Rate	190.08	484.87	-	294.78	-

See equations (1) through (3) in the main text for the expressions for the steady-state incarceration rates.

Table 3**Estimates of the Proportion of Men 18 to 55 Engaged in a Productive Activity, Non-Institutionalized and Idle, and Institutionalized by Race/Ethnicity from the 1980 and 2000 PUMS Files**

	1980	2000	Change, 2000 – 1980
Non-Hispanic White			
Employed/in school	0.899	0.878	-0.021
Idle	0.093	0.109	0.016
Institutionalized	0.008	0.014	0.006
Non-Hispanic Black			
Employed/in school	0.758	0.673	-0.085
Idle	0.206	0.239	0.033
Institutionalized	0.037	0.089	0.052
Non-Hispanic Asian			
Employed/in school	0.918	0.859	-0.059
Idle	0.079	0.135	0.056
Institutionalized	0.003	0.006	0.003
Hispanic			
Employed/in school	0.845	0.744	-0.101
Idle	0.140	0.226	0.086
Institutionalized	0.014	0.030	0.016

Tabulated from the 1980 and 2000 Census Public Use Microdata Samples. Men in the armed forces are included in the “Employed/ In School” category.

Table 4**Estimates of the Proportion of Men 18 to 55 Engaged in a Productive Activity, Non-Institutionalized and Idle, and Institutionalized by Race/Ethnicity and Education from the 1980 and 2000 PUMS Files**

	Non-Hispanic White		Non-Hispanic Black		Non-Hispanic Asian		Hispanic	
	1980	2000	1980	2000	1980	2000	1980	2000
Less than high school								
Employed/in school	0.794	0.698	0.658	0.430	0.804	0.699	0.793	0.667
Idle	0.185	0.257	0.285	0.364	0.186	0.278	0.188	0.297
Institutionalized	0.021	0.045	0.057	0.206	0.010	0.023	0.020	0.036
High school grad								
Employed/in school	0.895	0.835	0.776	0.630	0.889	0.793	0.864	0.734
Idle	0.099	0.146	0.197	0.284	0.106	0.195	0.124	0.232
Institutionalized	0.006	0.019	0.027	0.087	0.005	0.012	0.011	0.035
Some college								
Employed/in school	0.941	0.911	0.866	0.794	0.952	0.880	0.927	0.855
Idle	0.054	0.079	0.110	0.156	0.046	0.115	0.065	0.126
Institutionalized	0.005	0.009	0.024	0.050	0.002	0.005	0.007	0.019
College Plus								
Employed/in school	0.963	0.947	0.917	0.890	0.958	0.913	0.943	0.892
Idle	0.035	0.051	0.073	0.096	0.041	0.087	0.053	0.101
Institutionalized	0.002	0.002	0.011	0.014	0.000	0.000	0.004	0.007

Tabulated from the 1980 and 2000 Census Public Use Microdata Samples. Men in the armed forces are included in the "Employed/ In School" category.

Table 5
Estimates of the Proportion of Men 18 to 55 Engaged in a Productive Activity, Non-Institutionalized and Idle, and Institutionalized by Race/Ethnicity and Education from the 1980 and 2000 PUMS Files

	Less than High School							
	Non-Hispanic White		Non-Hispanic Black		Non-Hispanic Asian		Hispanic	
	1980	2000	1980	2000	1980	2000	1980	2000
Age 18 to 25								
Employed/in school	0.784	0.797	0.604	0.473	0.791	0.794	0.760	0.703
Idle	0.188	0.161	0.314	0.307	0.192	0.164	0.212	0.257
Institutionalized	0.028	0.041	0.081	0.221	0.017	0.043	0.028	0.039
Age 26 to 35								
Employed/in school	0.783	0.683	0.634	0.343	0.783	0.655	0.807	0.672
Idle	0.186	0.249	0.281	0.336	0.207	0.311	0.170	0.289
Institutionalized	0.032	0.069	0.085	0.321	0.010	0.034	0.023	0.039
Age 36 to 45								
Employed/in school	0.823	0.666	0.726	0.423	0.845	0.685	0.824	0.645
Idle	0.161	0.286	0.240	0.387	0.150	0.301	0.165	0.318
Institutionalized	0.016	0.047	0.034	0.191	0.005	0.013	0.011	0.038
	High School Graduates							
	Non-Hispanic White		Non-Hispanic Black		Non-Hispanic Asian		Hispanic	
	1980	2000	1980	2000	1980	2000	1980	2000
Age 18 to 25								
Employed/in school	0.872	0.843	0.742	0.634	0.871	0.848	0.844	0.760
Idle	0.121	0.136	0.229	0.281	0.123	0.140	0.145	0.206
Institutionalized	0.007	0.021	0.029	0.084	0.007	0.012	0.012	0.034
Age 26 to 35								
Employed/in school	0.900	0.845	0.780	0.624	0.888	0.769	0.874	0.726
Idle	0.093	0.131	0.184	0.259	0.104	0.213	0.111	0.231
Institutionalized	0.007	0.024	0.036	0.117	0.008	0.019	0.015	0.043
Age 36 to 45								
Employed/in school	0.926	0.845	0.827	0.635	0.913	0.785	0.898	0.725
Idle	0.069	0.137	0.156	0.280	0.085	0.208	0.094	0.244
Institutionalized	0.005	0.018	0.017	0.085	0.001	0.007	0.008	0.032

Tabulated from the 1980 and 2000 Census Public Use Microdata Samples. Men in the armed forces are included in the "Employed/ In School" category.

Table 6
Quartile Values of the Total Time Served During the 1990s and the Time Between the Date of First Admission and Date of Last Release for the 1990 Prison Cohort Between 18 and 25 Years of Age

Panel A: Distribution of Total Time Served

	25 th Percentile	50 th Percentile	75 th Percentile
All Inmates	1.44	2.79	4.81
White	1.43	3.09	5.12
Black	1.93	3.53	5.45
Hispanic	1.29	2.23	3.97

Panel B: Distribution of Time Between the Date of First Admission and the Date of Last Release

	25 th Percentile	50 th Percentile	75 th Percentile
All Inmates	1.86	4.99	8.71
White	2.01	6.17	9.11
Black	2.88	6.42	9.16
Hispanic	1.44	3.65	7.62

Tabulation are based on all individuals between the ages of 18 and 25 that entered the California state prison system during 1990 serving the first term of a commitment. Tabulation of the percentiles of the two time distributions are based on all terms served over the subsequent 10 years.