REDEMPTION IN THE PRESENCE OF WIDESPREAD CRIMINAL BACKGROUND CHECKS*

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Criminal background checks have now become ubiquitous because of advances in information technology and growing concerns about employer liability. Also, a large number of individual criminal records have accumulated and have been computerized in state repositories and commercial databases. As a result, many ex-offenders seeking employment could be haunted by a stale record. Recidivism probability declines with time "clean," so some point in time is reached when a person with a criminal record, who remained free of further contact with the criminal justice system, is of no greater risk than a counterpart of the same age—an indication of redemption from the mark of crime. Very little information exists on this measure of time until redemption and on how its value varies with the crime type and the offender's age at the time of the earlier event. Using data from a state criminal-history repository, we estimate the declining hazard of rearrest with time clean. We first estimate a point of redemption as the time when the hazard intersects the age–crime curve, which represents the arrest risk for the general population of the same age. We also estimate another similar

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redemption point when the declining hazard comes "sufficiently close" to the hazard of those who have never been arrested. We estimate both measures of redemption as a function of the age and the crime type of the earlier arrest. These findings aid in the development of guidelines for the users of background checking and in developing regulations to enhance employment opportunities for ex-offenders.

For 30 years I've lived a good life—so why should I have to tell a potential employer about my past? (Scanlon, 2000: 10)

THE BASIC PROBLEM OF REDEMPTION

People like Scanlon quoted above are not rare. Many people have made mistakes in their youthful past but have since turned themselves around and now live a respectful life. We define redemption, which is a term rooted in the religious concept that refers to forgiveness of past sins, as the process of "going straight" and being released from bearing the mark of crime. Until recently, society had a natural redemption process at work in the sense that a person who committed a crime could prove to be redeemed by leading a life as a productive member of society. In recent years, the opportunity for redemption has been in serious question. The following two important trends make the problem of redemption a growing public concern: 1) there has been an increasing demand for background checks for a wide variety of purposes, most importantly for employment assessment, and 2) a growing number of individual criminal records have accumulated and are becoming easily accessible electronically. With the rapid advancement in information technology, individuals with a criminal record are haunted not only by the question about their criminal background on job applications but also are faced with computerized criminal background checks, which are increasingly relied on by employers.[1] Criminal background checks reveal the individual's old criminal record and highlight that fact, which overshadows a law-abiding life led since. Computerized criminal records can have long memories, and this article is intended to provide guidance for imposing some limits to that memory.

Employers conduct background checks on job applicants for several different reasons. One reason may be to verify their moral character. Another reason, which is more directly related to the context of criminal-history background checks, may be the desire to assess their risk of committing crimes that could cause physical, financial, and reputational damage to the organization. We focus on this risk of reoffending by those

1. The concern has been raised at least since the 1970s (Maltz, 1976; Westin and Baker, 1972).

individuals who have prior criminal records. Considerable evidence exists that, after an initial period, the probability of recidivism declines monotonically with time free and clear of further contact with the criminal justice system. The current article addresses the following questions: How long does it take for an individual with a prior criminal record and no subsequent criminal involvement to be of no greater risk than persons of the same age in the general population?[2] How does an individual with a prior record compare with individuals with no prior record? How do those risks vary with the characteristics of the prior record, such as the crime type and age at the prior arrest?

PREVALENCE OF CRIMINAL BACKGROUND CHECKING

With the advancement in information technology and the Internet, individuals' criminal records have never been more easily accessible. The background-check industry is burgeoning. Numerous companies exist that acquire and compile criminal justice information obtained from the police and the courts and assemble a database for commercial purposes (Barada, 1998; Munro, 2002). SEARCH (the National Consortium for Justice Information and Statistics) reports that, "in addition to a few large industry players, there are hundreds, perhaps even thousands, of regional and local companies" that compile and/or sell criminal justice information to the end users (SEARCH, 2005: 7). They provide background-check services to private employers at their convenience in a timely manner at decreasing costs (SEARCH, 2005). A recent survey of firms from multiple cities in the United States reveals that about 50 percent check the criminal background of job applicants (Holzer, Raphael, and Stoll, 2004). Another survey finds that 80 percent of the large employers in the United States now run criminal background checks on their prospective employees (Society for Human Resources Management, 2004).

Some employers may conduct criminal background checks on job applicants voluntarily to identify those individuals who may commit criminal acts in the workplace to minimize loss and legal liability of negligent hiring that could result from such acts (Bushway, 1998). For some job positions that involve vulnerable populations, such as children and the elderly, laws require employers to conduct such background checks (Hahn, 1991). In addition, employers may use criminal history records to assess character flaws, such as lack of honesty and trustworthiness (Kurlychek, Brame, and

2. We know that recidivism risk declines with age, and so it is important to make the comparison with age-comparable individuals.

Bushway, 2007; Pager, 2007). Also, occupational licensing laws could disqualify many individuals based on the requirement of "good moral character" (Harris and Keller, 2005; May, 1995).[3] As the use of criminal background checks by employers has become widespread, criminal records could have lingering effects on employment prospects as "invisible punishment" or collateral consequences of contact with the criminal justice system (Travis, 2002).[4] Many employers show considerable reluctance to hire individuals with criminal records (Holzer, Raphael, and Stoll, 2003; Pager, 2003; Schwartz and Skolnick, 1962; Holzer, Raphael, and Stoll, 2004;[5] others have shown the relationship between criminal records and poorer employment prospects (Bushway, 1998; Grogger, 1995; Nagin and Waldfogel, 1995; Western, Kling, and Weiman, 2001).

PREVALENCE OF CRIMINAL RECORDS

In 2007, according to the Uniform Crime Report, law-enforcement agencies across the United States made over 14 million arrests (Federal Bureau of Investigation, 2008). On December 31, 2003, over 71 million criminal-history records were in the state criminal-history repositories (Bureau of Justice Statistics, 2006).[6] The increasing automation of criminal history records in the repositories has increased the number of records that are electronically accessible. At the end of 2003, about 90 percent of the records were automated, and the level of automation increased 57 percent from 1995 (Bureau of Justice Statistics, 2006).

Prior research suggests that the general public's chance of being arrested in their lifetime is high. Over 40 years ago, it was estimated that 50 percent of the U.S. male population would be arrested for a nontraffic offense in their lifetime (Christensen, 1967). Among those who have an

3. We do not elaborate more on employers' concern over whether a criminal record signals a lack of good character. The investigation of such considerations and its relationship with time clean warrant future research on employer judgments.
4. Collateral consequences of contact with the criminal justice system occur mostly outside the public view and affect ex-offenders beyond the imposed sentences (Travis, 2002: 16). They include restrictions on professional and occupational licensing, which are possibly important means for ex-offenders to increase their employment opportunities. The occupations that are affected by the restrictions range from health care, nursing, and education, to plumbing and barbering. Collateral consequences could also include denial of governmental benefits, such as welfare and public housing, termination of parental rights, and revocation or suspension of driver's licenses (Kethineni and Falcone, 2007; May, 1995; Petersilia, 2003; Samuels and Mukamal, 2004; Wheelock, 2005).
5. Some evidence suggests that the negative effect of criminal background checks on the hiring of ex-offenders is strongest for employers who are legally required to conduct such background checks (Stoll and Bushway, 2008).
6. An individual offender may have had records in multiple states.

arrest record, some have an isolated record that was acquired years ago and have maintained a clean record since then, but the evidence of contact with the criminal justice system, even if it was in the distant past, could remain in the repositories forever.

RELEVANCE OF CRIMINAL HISTORY

One rationale behind the practice of checking the criminal background of job applicants is that the employers recognize the strong positive relationship between past and future criminal offending. The continuity in criminal behavior has been validated by many studies (Blumstein, Farrington, and Moitra, 1985; Brame, Bushway, and Paternoster, 2003; Farrington, 1987; Piquero, Farrington, and Blumstein, 2003). Although these studies lend support to employers who would avoid any potential employees with a criminal-history record, these employers would also be well advised by some interlinked lines of research in criminology, which present equally strong evidence of desistance from crime in a subpopulation of those with past offenses. One line of research argues that changes in the life course of offenders affect their risk of future involvement in crime. For example, it is well established that a stable marriage and employment are powerful predictors of such desistance (Sampson and Laub, 1993; Sampson, Laub, and Wimer, 2006; Uggen, 1999; Wallman and Blumstein, 2006; Warr, 1998). Also, in another line of research, the age–crime curve demonstrates a steady decline in criminal activity after a peak in the late teens and young-adult period, and aging is one of the most powerful explanations of desistance (Farrington, 1986; Hirschi and Gottfredson, 1983; Sampson and Laub, 1993, 2003).

Most importantly for the current study, time clean since the last offense strongly affects the relationship between past and future offending behavior. Studies on recidivism consistently demonstrate that those who have offended in the past will have the highest probability of reoffending within several years, and the probability will decline steadily afterward (Maltz, 1984; Schmidt and Witte, 1988; Visher, Lattimore, and Linster, 1991). Two studies that tracked released U.S. prisoners show that of all those who were rearrested in the first 3 years, approximately two thirds were arrested in the first year, which indicates the declining recidivism rate over time (Beck and Shipley, 1997; Langan and Levin, 2002). Another study examined the effects of sentences on 962 felons convicted between 1976 and 1977 in Essex County, New Jersey, by following their recidivism (measured by rearrest) for over 20 years (Gottfredson, 1999). This study shows that although half of those rearrested were arrested within 2.2 years, 30 percent of the offenders remained arrest-free after the original sentence. The calculation based on the Essex data reveals that among those felons

who stayed free of crime for 10 years after the original conviction, only 3.3 percent were reconvicted within the next 10 years (Community Legal Services, Inc., 2005).

Numerous other studies have shown that recidivism occurs relatively quickly. However, little attention has been paid to the smaller population of ex-offenders who stay crime free for an extended period of time. Recent papers by Kurlychek and her colleagues have shed some light on the population characterized by long-time avoidance of crime (Kurlychek, Brame, and Bushway, 2006, 2007). Examining the hazard rate, they show that the risk of offending for those with criminal records converges toward the risk for those without a record as substantial time passes.

Kurlychek, Brame, and Bushway (2006) used the longitudinal data from the Second Philadelphia Birth Cohort Study (Tracy, Wolfgang, and Figlio, 1990). The major advantage of such longitudinal samples is that they have a representative population of nonoffenders, which makes it possible to compare the hazard of those with records to those without. However, longitudinal samples are often limited in size, and the follow-up may not be as complete as one desires.

MEASURES OF REDEMPTION

Although past wrongdoings are a useful sign of future trouble, this information has decreasing value over time because the risk of recidivism decreases monotonically with time clean. Thus, there can be a point at which we can be confident that redemption has occurred, where the risk of reoffending has subsided to the level of a reasonable comparison group. The problem here is that little empirical information exists that can help to establish that point. The absence of reliable empirical guidelines leaves employers no choice but to set their own arbitrarily selected cutoff points based on some intuitive sense of how long is long enough—inevitably with a conservative bias.[7] Given the importance of this issue, particularly for those individuals with other employment vulnerabilities, it becomes

7. For example, the Transportation Security Administration requires maritime workers to obtain a Transportation Worker Identification Credential (TWIC) to access secure areas of port facilities. Individuals are disqualified from getting a TWIC if they have been convicted for certain disqualifying criminal offenses within 7 years of the TWIC application (Transportation Security Administration, n.d.). To the best of our knowledge, the choice of the cutoff points is arbitrary and not based on any empirical analysis. Although 7 years seems to be a common restorative period, perhaps based on a view that 5 years is too short and 10 years is too long, some evidence exists that the cutoff points set by users of criminal records could be much larger or could be "indefinite" (Carey, 2004: 50). The Fair Credit Reporting Act states that a vendor of criminal history records may not report arrest information that is older than 7 years (Hinton, 2004).

important to develop empirical estimates of a reasonable point of redemption.

One such point, which we denote as T^*, is where the recidivism risk declines and crosses the level of the general population of the same age, and so it can serve as a point of redemption. These data can help an employer who has selected a job applicant for a position and wants to compare that individual's risk of arrest with someone of the same age from the general population. The crossover occurs because the general population includes people who have no criminal records as well as people who have multiple arrests.

Now, suppose an employer has multiple job applicants for a position, and a background check is run on all applicants. Those with no prior record (whom we designate as the "never arrested") are inherently less risky than those with a prior record, but that difference can diminish with the amount of time the individual with a prior arrest stays clean. This provides another point of redemption, when the recidivism risk of an individual with a criminal record is "sufficiently close" to one without, and we designate that point as T^{**}. T^{**} should be larger than T^* because the comparison group (the never arrested) are less risky than the general population.

It is reasonable to expect that T^* and T^{**} will vary with the crime type of the earlier arrest, which is denoted as C_1. Recidivism studies have shown that the crime type for which state prisoners were released was related to recidivism rates (Beck and Shipley, 1997; Langan and Levin, 2002). Prisoners who were released for "crimes for money," such as burglary, robbery, larceny, and motor vehicle theft, had the highest recidivism rates in both studies. T^* and T^{**} could also vary with the age of the prior arrest, which is denoted as A_1, and criminological research consistently indicates that an earlier onset age is a good predictor of a serious criminal career, which is characterized by a larger number of offenses and a longer career duration (Blumstein et al., 1986; Farrington et al., 1990; Farrington et al., 2003; Piquero, Farrington, and Blumstein, 2007). Because a prior record of violence, especially at younger ages, predicts more serious and chronic offending (Elliott, 1994; Farrington, 1991; Piquero, Farrington, and Blumstein, 2007), recidivism risk is expected to be higher for those whose early arrest was for violence (Piper, 1985).

Age and crime type of the prior arrest also should be taken into account in estimating T^* and T^{**} because the information about these factors usually appears in the criminal background reports that employers obtain, and so the information is available to be used in the hiring decision.

We are interested in developing estimates of T^* and T^{**} as a function of these characteristics of the earlier record. This approach is related to the more familiar approach of estimating recidivism probability. It is more

complicated, however, because one must examine the record over an appreciably longer period of time. In recidivism studies, it is usually sufficient to track individuals for as short as 5 years, because the large majority of individuals who will recidivate will do so within the first several years (e.g., Beck and Shipley, 1997; Langan and Levin, 2002). However, the estimation of T^* and T^{**}, particularly as a function of A_1 and C_1, requires observation over a much longer interval, long enough for the recidivism probability to become small enough. This process requires larger initial samples than those used in past studies (Kurlychek, Brame, and Bushway, 2006, 2007) so that we can estimate the recidivism probability with sufficient precision after most of any initial cohort has already recidivated.

RESEARCH APPROACHES AND RESULTS

This section first introduces the data used in the analysis to estimate hazard. It then describes the hazard estimation procedure. Next, an approach to comparing redemption candidates with the general population and the resulting estimates of T^* are discussed. Then, an approach to comparing redemption candidates with those who have never been arrested and the resulting estimates of T^{**} are discussed.

DATA

Our research approach requires starting with criminal-history records initiated long enough ago that we can be confident that after having been free and clean of arrests, the individuals with those records have a low residual risk of recidivism. On the other hand, we would like records from a time when the computerization of rap-sheet information was sufficiently advanced so that the computer records would provide an appropriate sample. Thus, we contacted the criminal-history repository in New York State asking for a sample of individuals arrested for the first time as adults in 1980. This information provided an interval of 27 years to follow the individuals and assess their recidivism probabilities. It also provided a large enough population to disaggregate into a reasonable number of interesting crime types and age at first arrest and still have an adequate number of individuals who have remained clean of crime 10, 20, and even 25 years later.

Over 88,000 individuals were recorded as experiencing their first arrest in 1980 in New York State.[8] From this total population, we focus on individuals whose age at first arrest was 16, 18, and 20 years.[9] The crime types we focus on here have to be sufficiently numerous, reasonably serious [e.g., we avoid driving under the influence (DUI)], and less than permanently damaging (e.g., murder). Our analysis of T^* focuses on three offenses: robbery, burglary, and aggravated assault. This selection of offenses is based on their prevalence in arrest records and on the fact that a first adult arrest for one of them is relatively unlikely to lead to incarceration, and especially to a long period of incarceration, which would complicate our analysis.[10] The analysis of T^{**} uses two broader categories of C_1, violent and property, to have the larger sample sizes that are needed to generate the desired precision in estimating hazard as t becomes large. Table 1 provides the distribution of the sample by age and crime type at first arrest.

ESTIMATION MODELS OF REARREST RISK

We model time to recidivism using survival analysis, which is a statistical method developed to study the occurrence and the timing of events. Because the methods are flexible and generic, they have been used for studying a wide variety of events, such as deaths, marriages, cancer cures, unemployment, militarized disputes, earthquakes, equipment failures, and so on. Criminologists have long used the methods to study recidivism (e.g., Maltz, 1984; Schmidt and Witte, 1988; for review, see Chung, Schmidt, and Witte, 1991). Our analysis uses hazard (or hazard rate) to examine the

8. The data received include all individuals with an arrest recorded in the New York State Division of Criminal Justice Services repository of criminal-history records. There are other individuals with one or more arrests that were sealed but with no unsealed arrests; these individuals were not included in the files we examined. In a background check, these individuals would presumably appear as never arrested. It is also possible that individuals with an initial arrest in 1980 that was sealed before they had an opportunity for a second arrest after 1980, and then appeared at a later time with an arrest that was not sealed; in that case, their second arrest would have been recorded with a different ID number and would not have been included in our 1980 sample. We were unable to link the two components of such an individual's records. This selection process dropped people whose arrest frequency (λ) may have been relatively low from our sample; thus, our hazard estimates may be somewhat higher than if they were included, and that would also have made our T^* and T^{**} estimates somewhat higher.
9. In contrast to most other jurisdictions, New York considers 16-year-olds to be "adults."
10. Incarceration after the first arrest is very unlikely for our three crime types except for robbery. About 10 percent of those who were arrested for robbery in 1980 went to prison. Excluding them does not change our findings in any important way.

Table 1. Initial Sample Size, *n* by First Offense (C_1) and Age at First Arrest (A_1)

First Offense	Age at First Arrest 16	18	20
Robbery	937	382	197
Burglary	1,956	763	387
Aggravated assault	230	205	169
Violent	1,861	1,151	794
Property	5,238	2,986	1,833

timing of redemption and how it varies with offense type and age at first arrest.

Let T be the time until a new arrest. Hazard, $h(t)$, is the conditional probability of a new arrest given surviving without an arrest up to time t, which can be written as follows:

$$h(t)=\Pr(T=t \mid T\geq t) = \frac{\#\text{ of the 1980 sample who have a new arrest time period } t}{\#\text{ of the 1980 sample who have not had a new arrest before } t} \quad (1)$$

This measure is precisely the quantity employers and others would use to evaluate the offending risk of a person who has been revealed by the background check to have committed a crime t years ago and none since (Kurlychek, Brame, and Bushway, 2006).

In calculating $h(t)$, we count a new arrest (after their initial arrest in 1980) for any offense type except DUI.[11] Thus, for example, a new arrest is marked when a person whose first arrest in 1980 was for burglary is rearrested for burglary or for any nonburglary offense, other than DUI.

We estimate the hazard, given conditions at first arrest, namely the age A_1 and the crime type C_1 of the first arrest. Figure 1a displays $h(t)$ for A_1 of 16, 18, and 20 years for C_1 of burglary.[12] Figure 1b shows $h(t)$ for $A_1 = 18$ years for C_1 = robbery, burglary, and aggravated assault. As expected, $h(t)$ varies with A_1 and C_1. The hazard curves differ primarily in the first 10 years, with robbery tending to have the highest conditional rearrest probability, whereas burglary and aggravated assault follow a similar,

11. In some cases, we find that an arrest is followed quickly by another arrest. We are concerned that what seems to be a new "arrest" might be related to the same crime event as the prior arrest (e.g., transfer to a different jurisdiction), so we count an arrest as a new arrest only if it occurs at least 30 days after the prior arrest.

12. To reduce random fluctuations, all hazard curves ($h(t)$) for $t = 2$ in figures 1 to 4 are smoothed using five-point smoothing, which is also known as a running mean or a moving average with a window width of five (i.e., $h'(t) = [h(t-2) + h(t-1) + h(t) + h(t+1) + h(t+2)] / 5$), and the horizontal axis begins at $t = 2$.

Figure 1a. Hazard Rate *h(t)*: Age 16, 18, 20 Burglary

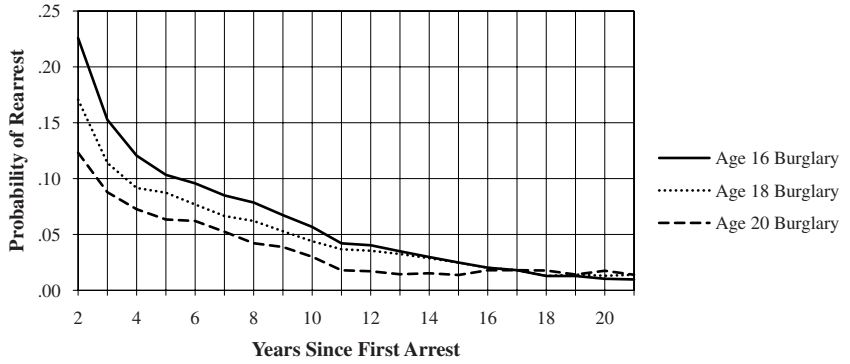
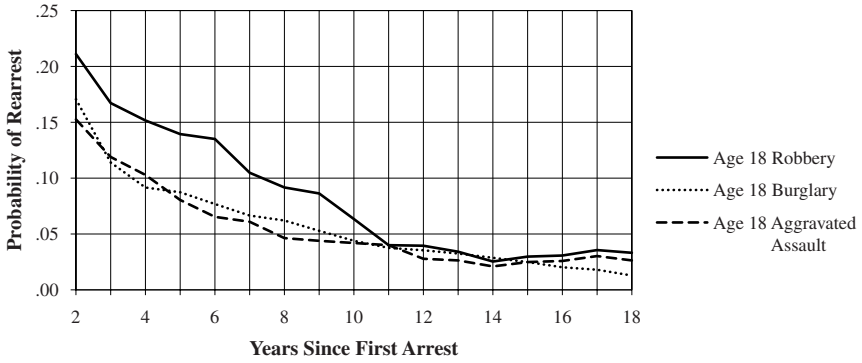


Figure 1b. Hazard Rate *h(t)*: Age 18 Robbery, Burglary, and Aggravated Assault



lower trend. Also, a younger A_1 is associated with a higher hazard. These patterns have important implications in estimating T^*, to which we turn next.

COMPARISON WITH THE GENERAL POPULATION

Approach

We are interested in finding T^*, which is the value of t where the risk of a new arrest matches the risk of arrest for the general population of the same age. We estimate the risk of arrest for the general population by the age–crime curve whose horizontal axis is age (A) and whose vertical axis is the age-specific arrest rate of people of age A, which is the ratio of the number of arrests of age A to the population of age A from a particular

year. Instead of using the conventional age–crime curve, we construct a *progressive* age–crime curve, in which the age-specific arrest probability for those who were of age A_1 in 1980 is calculated from the number of arrests and the population of age A_1 in 1980, the number of arrests and the population of age $(A_1 + 1)$ in 1981, those of age $(A_1 + 2)$ in 1982, and so on.[13] As a result of the way this *progressive* age–crime curve is constructed, it takes into account the period effect, which is not observed in the traditional age–crime curve.[14] Here, we count arrests for any offense except DUI, suspicion, and "other" offenses so that the range of offenses for which an arrest is made is comparable with the range of offenses considered for a new arrest for redemption candidates.

The two curves, the hazard and the age–crime curve, are expected to cross at T^* years for two reasons. First, the age–crime curve includes, among the larger population, those who were never arrested as well as those who recently offended and thus have a reasonably high risk of reoffending. In contrast, the redemption candidates have been arrest free for T^* years, during which time the risk, or hazard rate, should have fallen substantially.

Results

Table 2 shows the values of T^* by offense type at first arrest (C_1) and age at first arrest (A_1).[15] In general, reasonable differences in values of T^* are observed across offense types and ages at first arrest. Overall, those who were arrested for robbery take the longest time, about 9 years for 16-year-olds, about 8 years for 18-year-olds, and about 4 years for 20-year-olds, to be similar to their age cohorts from the general population in

13. More generally, the value of the age–crime curve in year t after the first arrest of persons of A_1 in 1980 is given by the number of arrests of people of age $(A_1 + t)$ in year $(1980 + t)$ divided by the population of that age in that year. The sample cohort is from New York, so the age–crime curve as a comparison is also from New York. The number of arrests by age in New York is from the Uniform Crime Reports (Federal Bureau of Investigation, 1981–2001; National Consortium on Violence Research, April 10, 2008), and the population of New York State is from the census (U.S. Census Bureau, 1996, 2000, 2007). Similar to how the hazard curves are smoothed, the age–crime curve is smoothed using three-point smoothing.
14. The period effect could be of special importance in estimating T^* for the redemption candidates, who were first arrested in 1980 and were followed thereafter. The late 1980s through the early 1990s witnessed a significant increase in the violent crime rate (Blumstein and Wallman, 2006). Because the redemption candidates arrested in 1980 were experiencing an anomalously high crime period, their progressive age–crime curve incorporates the period effect, which accounts for the nonmonotonic decline with age.
15. The values of T^* are calculated as the intersection of the smoothed age–crime curve and the smoothed hazard by linear interpolation.

terms of the probability of an arrest. Interestingly, the probability of a new arrest at T^* is relatively consistent across different ages at first arrest and offense types, being close to .10.

Table 2. Values of T^* by C_1 and A_1 (Arrest Probability at T^* in Brackets)

First Offense	Age at First Arrest 16	18	20
Robbery	8.5 (.103)	7.7 (.096)	4.4 (.086)
Burglary	4.9 (.105)	3.8 (.097)	3.2 (.086)
Aggravated assault	4.9 (.105)	4.3 (.098)	3.3 (.086)

Across each of the crime types, the youngest A_1 is associated with the largest value of T^*. This result is consistent with general findings in criminology that younger starters persist longer in their criminal careers (Piquero, Farrington, and Blumstein, 2007). Also, the magnitude of T^* is consistently largest for robbery but varies with A_1 for burglary and aggravated assault.

For illustrative purposes, figures 2a and 2b show hazard curves for three conditions: (figure 2a: C_1 = Robbery, A_1 = 18) and (figure 2b: Burglary, 16) and the corresponding progressive age–crime curves (i.e., for the t years after the first arrest) and the resulting intersection, T^*.

Figure 2a. Comparison with Age–Crime Curve: Age 18 Robbery

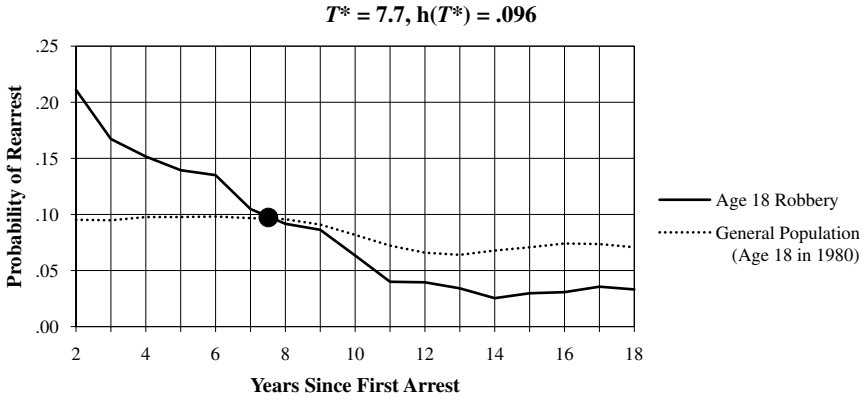
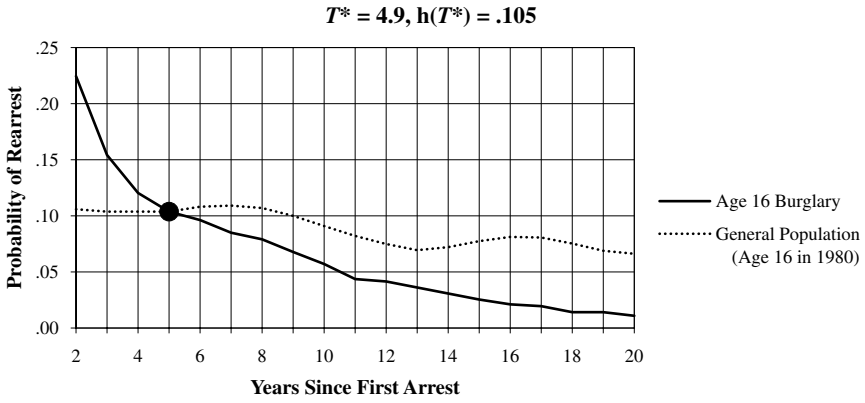


Figure 2b. Comparison with Age–Crime Curve: Age 16 Burglary



COMPARISON WITH THE "NEVER ARRESTED"

Our previous analysis estimated T^* as a point of redemption by comparing people with a prior record who have stayed clean with members of the general population of the same age. In contrast to T^*, which can be calculated as an intersection of two curves, a comparison with the never arrested inherently involves more complex choices. Because the risk of rearrest for a redemption candidate might be expected to approach, but not cross, the risk of arrest for the never arrested, it becomes a matter of having to assess when the two curves are "close enough."

APPROACH

Approximating the hazard of the never arrested. Information about the never arrested is not directly available in any repository-based data set that contains records of only those who have been arrested.[16] One approach to estimating the hazard of the never arrested involves using the 1980 age distribution of New York and the age distribution of 1980 first-time arrestees. Assuming stationarity as in estimation of life tables, we can approximate the population of the never arrested at age A ($P_{na}(A)$) as follows:[17]

$P_{na}(A)$ = Population of NY of age A in 1980 – Σ (first-time arrestees in 1980 for all $A_1 < A$).

16. Kurlychek, Brame, and Bushway (2006, 2007) pursued this issue using cohort data sets, but such data sets are often too limited for estimating hazard rates for the small fraction of individuals with a prior arrest who remain clean for a reasonable time.
17. We only consider arrests at adult ages in NY ($A_1 = 16$).

As a result, the hazard of the never arrested at age A, ($h_{na}(A)$), is calculated as follows:[18]

$$h_{na}(A) = \frac{\text{Number of first-time arrestees for } A_1 = A}{P_{na}(A)} \quad (2)$$

Figure 3 displays our estimate of $h_{na}(A)$. It is evident that the younger ages are associated with higher risk of arrest, but even at age 16, the hazard is less than .03, which is clearly much lower than the risk of rearrest of those with a prior arrest. We can now compare the hazard of redemption candidates whose first arrest occurs at age A_1, $h(t)$, with the hazard of the never arrested, $h_{na}(t{=}A{-}A_1)$.

Figure 3. Hazard of the Never Arrested, $h_{na}(A)$

Determining "close enough." We designate as T^{**} the point when the hazard of an individual with a criminal record $h(t)$ is sufficiently close to that of one without. Figure 4 shows $h(t)$ for $A_1 = 18$ for C_1 = property crimes and violent crimes, as well as $h_{na}(t)$.[19] We first note that $h(t)$ declines considerably faster than $h_{na}(t)$. However, aside from random fluctuations, $h(t)$ comes very close to $h_{na}(t)$ but remains above it, even at $t >$

18. For the same reason as discussed in footnote 8, $h_{na}(A)$ may be higher if the individuals who have one or more arrests that were sealed but with no unsealed arrests were included.

19. The comparison with the risk of the never arrested is particularly sensitive to the diminished sample size, so we use two broad categories of C_1, violent and property crimes. Here, violent crimes are designated to include robbery, aggravated assault, forcible rape, and simple assault. Murder and non-negligent manslaughter are not included as C_1 because special conditions are likely to apply to their redemption. Property crimes are designated to include burglary, larceny, motor vehicle theft, stolen property, fraud, forgery, and embezzlement.

20. Given these observations, our question is when the redemption candidate's risk is deemed "close enough" to that of the never arrested.

Our approach invokes the use of confidence intervals. Using the estimated risk of the never arrested $h_{na}(t)$, we estimate T^{**} as the lowest value of t such that the upper bound of the confidence interval of $h(t)$ becomes smaller than or equal to $(h_{na}(t)+\delta)$, where δ represents a risk difference that an employer is willing to tolerate.[20,21]

20. This approach of estimating T^{**} is equivalent to carrying out a hypothesis test where the null hypothesis states that the difference between $h(t)$ and $h_{na}(t)$ is greater than δ. The alternative hypothesis is that the difference is less than or equal to δ. Thus, it is of the following form:

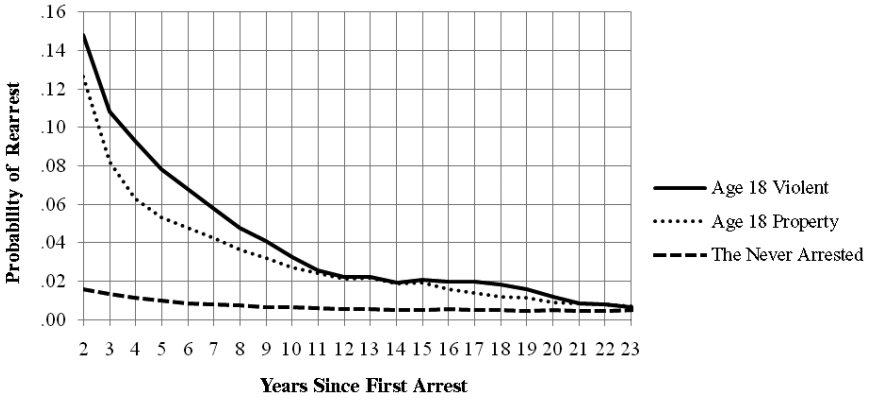
$$H_0: h(t) > \delta + h_{na}(t) \text{ versus } H_1: h(t) \leq \delta + h_{na}(t).$$

We would reject the null hypothesis at $t = T^{**}$, where the *upper* bound of the confidence interval of $h(t)$ first intersects $(h_{na}(t) + \delta)$. This approach is motivated by the literature on (bio)equivalence tests where the studies want to show that the effectiveness of new treatments (drugs, vaccines, diagnoses, etc.) is no worse than the standard, existing treatment by a specified margin (e.g., Barker et al., 2001; Westlake, 1976).

Our approach is different from the more familiar approach of determining whether $h(t)$ is "close enough" to $h_{na}(t)$ by carrying out a hypothesis test with the null hypothesis stating $h(t)$ is equal to $h_{na}(t)$ and concluding that $h(t)$ is "statistically indistinguishable" from $h_{na}(t)$ when we fail to reject the null hypothesis. This corresponds to constructing confidence intervals around $h(t)$ and denoting T^{**} as the intersection of the *lower* bound of the confidence interval of $h(t)$ with $h_{na}(t)$. However, smaller sample sizes inevitably make confidence intervals wider, which reflects the larger uncertainty of the estimates. If T^{**} were estimated using the lower bound of the confidence interval of $h(t)$, then wider confidence intervals would lead inappropriately to smaller values of T^{**}, possibly producing unreasonable values of T^{**} less than T^{*}. By introducing δ and using the upper bound of the confidence interval, our approach circumvents this shortcoming.

The conventional standard error of $h(t)$ can be calculated by the formula $\sqrt{[h(t) * (1 - h(t)] / n(t)}$. However, this formula relies on the asymptotic normality of the estimate of $h(t)$. Because the sample sizes defining $h(t)$ become small when t is large, the standard errors calculated by the formula above are questionable. Moreover, in this case, the symmetric confidence intervals can include negative lower endpoints, which are a problem of "overshoot" (Newcombe, 1998); because we are trying to estimate the proportion of those who are rearrested at t, those estimates have to be bounded between 0 and 1, and so cannot go negative. The standard confidence interval of a proportion (often referred to as the Wald interval) is also known to show erratic behaviors in terms of the coverage probability, regardless of sample sizes and the values of $h(t)$ (Brown, Cai, and DasGupta, 2001). Given the limitations of the Wald interval for $h(t)$, we use the statistical method of "bootstrap." The bootstrap provides a reliable method to estimate the uncertainty of an estimator via resampling, without relying on the asymptotic properties of the estimator. We used the bias-corrected and accelerated (BCa) bootstrap intervals for $h(t)$, with the number of bootstrap samples, B = 2001 (Efron, 1987; Efron and Tibshirani, 1993; Wu, 1989). Confidence intervals can be constructed using methods other than the bootstrap (Brown, Cai, and DasGupta, 2001; Newcombe, 1998).

Figure 4. Comparison with the Never Arrested (Age 18 Violent, Property)



RESULTS

Suppose that an employer can accept $\delta = .05$, whereby a redemption candidate's hazard can be as much as .05 higher than the hazard of a never arrested person of the same age. Then we estimate $T^{**} = 4.8$ for C_1 = property and $T^{**} = 8.0$ for C_1 = violent (both for $A_1 = 18$) using the 95 percent confidence interval. The more tolerant an employer is (larger value of δ), the shorter the redemption time (smaller value of T^{**}). Figure 5 shows this tradeoff between δ and T^{**} for three different conditions of the first arrest. Violent offenders have consistently higher values of T^{**} than property offenders, indicating that violent offenders need to stay clean longer for the same risk-tolerance difference. It also demonstrates that a younger A_1 is associated with a longer time necessary for property offenders to be comparable with the never arrested of the same age at a given tolerance level δ.[22]

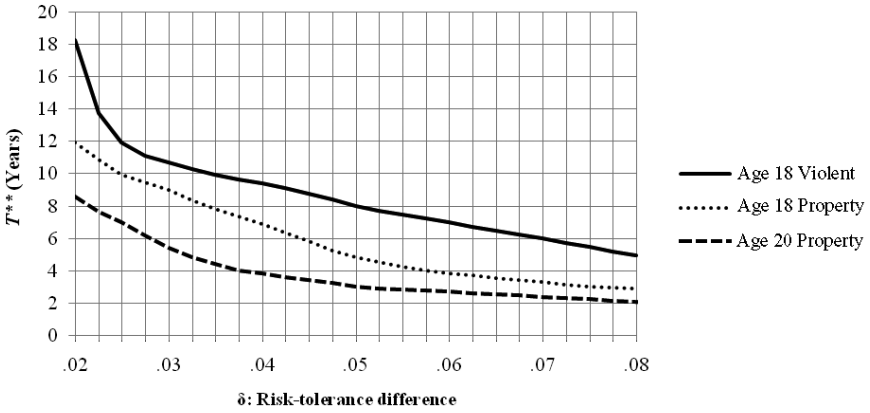
For the employer who is more accepting of risk and willing to focus on the intersection of the two hazard curves ($h(t)$ and $h_{na}(t)$), the values of

21. Alternatively, an employer can formulate the risk tolerance as a risk ratio (or a relative risk) of $h(t)$ to $h_{na}(t)$.

22. Another approach to comparing redemption candidates with the never arrested is to recognize that the comparison need not be of two candidates of the same age. Because the hazard declines with age, younger never arrested individuals may exist whose hazard is no less than that of an older individual with a prior arrest but who has stayed clean for a long period. It could also be the case that, based on some existing base rates for workplace deviant behaviors (e.g., Bachman, 1994; Slora, 1989), some employers might have a specific risk level, γ, below which the risk is tolerable or acceptable for the purpose at hand (e.g., a particular job position in a particular industry).

T^{**} at the same value of δ (.05) and A_1 (18) would be 4.2 years for property and 7.0 years for violence compared with 4.8 years for property and 8.0 years for violent using the above approach that employs the upper bound of the confidence interval. The values of T^{**} based on the intersection of the hazards are lower than those for the conservative employer who wants high confidence that the candidate represents a low risk.

Figure 5. Tradeoff between δ and T^{**} (Based on the Upper Bound of the Confidence Interval of $h(t)$)



ISSUES STILL TO BE ADDRESSED

We believe that our results represent a significant step forward in an area where so little is known empirically about the redemption process. As usual, however, some important efforts remain. We have identified T^{*} as the minimum duration of time clean in New York State for the recidivism probability to drop below the norm for New Yorkers of the same age. We have also identified approaches to estimating T^{**}, when the recidivism probability falls below any specified level compared with people never arrested. It is possible, however, that an individual who stayed clean in New York was arrested in another state. Thus, our estimates are lower bounds on T^{*} (and T^{**}) and the associated recidivism probability. One study on the recidivism of prisoners estimated that 7.6 percent of the released prisoners were rearrested out of state (Langan and Levin, 2002). Another finds that, among the prisoners who were released from 11 state prisons in 1983, roughly 10 percent of them have out-of-state arrests within 3 years of their release (Orsagh, 1992). To address this concern about mobility, we have approached the Federal Bureau of Investigation, which maintains a national index of rap-sheet records in the Interstate Identification Index. We can present them with identification information of the

individuals who have stayed clean in New York and should be able to obtain information on their arrests elsewhere in the nation. That method will raise the *h(t)* curve somewhat and so increase the value of *T** and *T***. The correction could be reasonably large for a state like New York, where the large fraction of offenders from New York City could easily commit other offenses in a neighboring state.[23] We would anticipate that the correction would be appreciably less in a state like California, where the major metropolitan areas are much more remote from neighboring states.

A second issue that warrants additional analysis is the distinction between arrest information and conviction information. In many settings, it is considered either inappropriate or illegal to ask about an arrest record in the absence of a following conviction.[24] We intend to pursue this analysis using only conviction information. Of course, the initial sample will become smaller because many of our arrests were not followed by convictions. But of those convicted, we would anticipate that *T** and *T*** would be larger, because people who were convicted ("true" offenders) would be more likely to have subsequent arrests than those who were acquitted or whose cases were dismissed ("ambiguous" offenders).

Another small correction should be made for time in custody. The estimation of hazard assumes that the entire initial sample of arrestees is at risk of an additional arrest shortly after their prior arrest. However, those who are incarcerated as a result of the first arrest are at risk of a new arrest only after their release from incarceration. Thus, the estimation needs to be adjusted for the incarceration time. Unfortunately, identifying correction information from rap sheets is not easy. However, considering that the 1980 arrest is the first arrest for the sample of arrestees, it is not likely that any lengthy period of incarceration follows that first arrest.

It is possible that conditions in New York are distinctively different from other states or that offenders first arrested in 1980 were different from those arrested more recently, so it is important that we generate robustness tests of the findings presented here. That approach will include collecting data from multiple states to examine how patterns of redemption vary across the states. This analysis will provide an opportunity to look across the states to determine whether their offending patterns or their arrest patterns differ. We also intend to take subsequent draws of people whose first arrest occurred in 1985, 1990, and 1995. These samples will have a shorter observation period, especially for the 1995 sample, but we

23. We anticipate that the younger arrestees we focus on are less mobile than older counterparts and thus are less likely to have out-of-state records.

24. According to the guidelines published by the Equal Employment Opportunity Commission (EEOC), employers may not deny employment based on arrests that did not lead to convictions unless there is a business justification (EEOC, 1990).

anticipate that what we lose in observation time will be more than compensated with the richer quality of the records as we move into more contemporary computerization of records. Since the National Criminal History Information Program was initiated in 1995 to improve the quality of criminal-history records in state repositories, it is expected that we will observe increased accuracy and completeness in the criminal history of the 1995 or even the 1990 sample. Also, if our estimates of T^* roughly persist, then a 10-year observation interval should be adequate.[25] Examining multiple cohorts of arrestees will also allow us to generate information on time trends in arrest patterns and in recidivism patterns as well as information on any period effect.

POLICY IMPLICATIONS

The information and approaches we have generated here should be of considerable value in enhancing redemption opportunities and consequent employment opportunities for individuals who made a mistake in the past but have since lived a lawful life. The knowledge of T^* and T^{**} could be used in many ways by various pertinent parties to facilitate the redemption process.

USERS OF CRIMINAL RECORDS

EMPLOYERS

Employers who run background checks on job applicants could be given a brief document informing them of the diminished value of records older than T^* or T^{**} years for risk assessment purposes.[26] Because employers have a strong concern about liability suits, a statute could protect them from such due-diligence vulnerability in case they hire someone whose last arrest was longer ago than T^* or T^{**}.[27] This would be a relief for employers who are otherwise willing to hire individuals with criminal records, and it would add to the existing incentives such as Work Opportunity Tax Credit (WOTC) and Federal Bonding Program (FBP).[28]

25. Depending on the approach to estimating T^{**} and the choice of δ and γ, the values of T^{**} could be as large as 25 years. Thus, the desired estimation of T^{**} might not be possible from a 1990 sample, especially from a 1995 sample.
26. Users of background checks should base their decision not only on the information about criminal history but also on information about other important factors (such as employment history, marriage, and educational attainment).
27. Although such legal protections would most likely be welcomed by employers, their concern over possible damage to the organization's reputation would not be eliminated (Fahey, Roberts, and Engel, 2006).
28. For more details about WOTC, see http://www.doleta.gov/business/incentives/opptax/. More details about FBP are available at http://www.bonds4jobs.com/index.html.

Such liability-protection statutes could also be applicable to employers that ask applicants about their criminal background, but it would limit their inquiries to criminal involvements that occur within the last *T** or *T*** years. This statute would be relevant to the concerns of the "ban the box" movement.[29]

Pardon Boards

The governor of each state is empowered to grant a pardon as an act of clemency and forgiveness. Most typically, a pardon board reviews relevant information about the individual seeking clemency and makes a recommendation to the governor. Although the length of the law-abiding period is considered one of the most important factors in pardon applications, it is not clear whether pardon boards have reliable guidelines as to how long a law-abiding period should be for the individual to be deemed appropriate for pardon.[30] Although pardons are hard to obtain, especially for the poor, pardons have a significant restorative effect that signals that the pardoned individual is rehabilitated (Love, 2003).

DISTRIBUTORS OF CRIMINAL RECORDS

Repositories

State record repositories could adopt a policy not to disseminate criminal record information older than *T** or *T*** years. This regulation could apply specifically to the states that make their criminal-history information publicly available on the Internet.[31] States are clearly moving in the direction of making individual criminal records more publicly accessible (Jacobs, 2006). However, given the lasting consequence of disseminated records on a large number of individuals, finding means to limit the dissemination would be a realistic approach to the problem.[32] The state could

29. The "box" refers to a question on job applications that asks prospective employee whether they have ever been convicted of a crime. So far, the movements to "ban the box" have been largely limited to employment for city governments (Henry and Jacobs, 2007; National Employment Law Project, 2008).

30. For example, in Pennsylvania, the Board of Pardons (2005: 1) publicly states that the length of time free of crime after the offense is one of the best indicators of rehabilitation that the applicant can demonstrate.

31. In 2001, 13 states (of the 38 that responded to the survey) provide public access to criminal history records through the Internet (SEARCH, 2001). [Samuels and Mukamal (2004) report that 28 states allow Internet access to criminal records.]

32. Some employers might "statistically discriminate" based on correlating individual characteristics of a job applicant with generic covariates of criminal activity such as race and ethnicity. As a result, limiting employers' access to criminal records could possibly have an adverse consequence for those without criminal records (Bushway, 2004; Finlay, in press; Freeman, 2008; Holzer, Raphael, and Stoll, 2006; Pager, 2003; Raphael, 2006).

adopt a policy to seal repository records of events older than T^* or T^{**} years in response to a request from a non-criminal justice agency. Such sealed records could still be accessible for criminal justice purposes. A more aggressive approach would be to expunge records older than T^* or T^{**} years.

Even though these judicial procedures tend to be more accessible and reliable than pardon, the popularity of sealing and expungement peaked in the 1970s and has severely declined since then in most jurisdictions (Love, 2003, 2006). Moreover, Love (2003, 2006) reports that no one standard exists in terms of what it means to have a record sealed, expunged, set aside, vacated, or annulled. A record being expunged does not necessarily mean that the record is literally destroyed; rather, the expunged records "almost always remain available for use by law enforcement agencies and the courts, and in some states they may be accessible to other public agencies and even to private investigative services hired to perform criminal background checks for employers" (Love, 2003: 121). Furthermore, critics of sealing and expungement argue that the concealment of records and the denying of past wrongdoing are institutionalized deception and are not compatible with the pursuit of truth, the foundation of a legal system (Franklin and Johnsen, 1981; Kogon and Loughery, 1970).

Despite these criticisms, concealment and denial of criminal records after some "rehabilitation period" are common in many countries. For instance, in the United Kingdom, according to the Rehabilitation of Offenders Act 1974, those who are convicted of certain crimes, after specified rehabilitation periods, are treated as though the crime never happened, and are not obligated to reveal the record when asked at employment settings.[33, 34]

Commercial Vendors

Because many employers rely on background-check services provided by commercial vendors of criminal records, if states seal or expunge records older than T^* or T^{**} years, this policy should be accompanied by a process of requiring those old records also to be erased from commercial databases.[35]

33. The Rehabilitation of Offenders Act of 1974 followed a report called *Living It Down: The Problem of Old Convictions*, which is a report of a committee chaired by Lord Gardiner (1972). The report shows that the longer a convicted person remains crime free, the less likely that the person will commit another crime.
34. For more on the sealing and expungement of criminal records in the European Union, see Loucks, Lyner, and Sullivan (1998).
35. Given the discrepancy between the records from official sources (state repositories) and the records from commercial databases (Bushway et al., 2007), it is important that any update (i.e., sealing or expungement) that takes place on the

CERTIFICATES OF REHABILITATION

The main criticisms of sealing and expungement include the compromise of governmental transparency as well as the possible adverse effect on nonoffenders because of statistical discrimination.[36] Certificates of rehabilitation and other similar means can circumvent the problem. Certificates of rehabilitation are designed to remove certain collateral consequences for eligible ex-offenders and can potentially enhance their employment prospects.[37] The certificates reward good behavior of ex-offenders by explicitly acknowledging them as being rehabilitated rather than erasing the record of their contact with the criminal justice system. Thus, these certificates are similar to pardons in spirit but are relatively more accessible than pardons. Currently, only a handful of states issue such certificates (Love and Frazier, 2006; Samuels and Mukamal, 2004), but they could be used more widely by taking advantage of the empirical evidence of T^* and T^{**}.[38]

SUMMARY

As background checking has become a routine practice for many employers, and an increasing number of criminal records have become electronically accessible, those who made a mistake many years ago but have since lived a law-abiding life face hardships in finding employment. The risk of recidivism declines with time clean, so we know that a person who has stayed clean for an extended period of time must be of low risk. The question is the extent to which the risk drops over time, and at what point in time the risk is deemed low enough. This article addresses these questions by examining the hazard of those who were first arrested in 1980

official records is reflected on the records in the commercial sources. Jacobs and Crepet (2008) highlight the difficulty in forcing vendors to make such changes because their right to access the criminal records would be protected by the First Amendment of the Constitution.

36. See footnote 32.

37. Criminal history records are regarded as "negative credentials" that signify "social stigma and generalized assumptions of untrustworthiness or undesirability" (Pager, 2007: 33; see also Jacobs, 2006 and Jacobs and Crepet, 2008), whereas certificates of rehabilitation attempt to emphasize the progress made by the ex-offender. Regarding more fair representation of riskiness by taking into account the positive factors, Bushway et al. (2007) mention that it is conceivable for the government to devise some score (like a credit score) that indicates the risk of offending, which can be affected by positive factors such as the length of crime-free time, completion of a drug treatment program, and vocational training, as well as negative factors such as committing another crime (for a similar approach, see Freeman, 2008).

38. Bushway and Sweeten (2007) discuss policy implications regarding the diminished value of old criminal records in the context of collateral consequences.

and by estimating a point of redemption by comparing the hazard of redemption candidates with 1) the risk of an arrest for individuals of the same age in the general population and 2) with the risk of an arrest for those who have never been arrested.

The results indicate that the risk indeed declines monotonically over time and, after some point T^*, becomes lower than the risk of arrest of someone of the same age in the general public represented by the age–crime curve. The article also produced reasonable approaches to estimating another measure of redemption, T^{**}, which is the number of years that those who have a prior arrest need to stay clean to be considered "close enough" to those who have never been arrested. The results also demonstrate that T^* and T^{**} vary with age and crime type of the earlier arrest. Younger starting age generally points to a longer time necessary to become comparable with a person of the same age from the general population. We find that violent offenders have to wait longer than property offenders to meet the same criterion of redemption. Because the information about age and crime type of the earlier arrest is usually available on criminal background reports that employers and other users of criminal records obtain, it is important that T^* and T^{**} are estimated as a function of these two factors.

The findings have several important policy implications; they are helpful in informing two broad categories of entities as follows: those who are in a position to disseminate criminal-history information (i.e., state repositories and commercial vendors of criminal records) and those who are responsible for determining the relevance of criminal records (i.e., judges, pardon boards, and employers). All of the policy approaches discussed could be considered by the respective entities, but using any of them requires information and judgment about the relevant values of T^* or T^{**}.

As we outlined in the section on future research plans, this research is clearly ongoing. Because currently no empirical basis exists for knowing about the variability of T^* and T^{**} across states or across time, we will be conducting similar analyses on data from other states and on data from other arrest cohorts. This approach will allow us to be in a better position to provide more complete and robust information about T^* and T^{**}. In the meantime, even the preliminary estimates in this article should be helpful in moving the policy process forward.

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