The Digital Scarlet Letter:

The Effect of Online Criminal Records on Crime

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Abstract

How does public access to criminal records affect crime? Economic theory suggests that expanding access to criminal information may increase the cost of crime to potential criminals by endangering their future work prospects and thus act as a deterrent. However, increased provision of information could also obstruct ex-convicts from finding legal employment and lead to higher recidivism rates. I exploit the state and time variation in the introduction of state-maintained online criminal databases – which represent a sharp drop in the cost and effort of gaining criminal background information on another person – to empirically investigate the trade-off between deterrence and recidivism. I find that online criminal records lead to a small net reduction in property crime rates, but also a marked increase of approximately 11 percent in recidivism among ex-offenders.

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1.   Introduction

How does public access to criminal records affect crime? On one hand, greater provision of criminal background information may increase the opportunity cost of crime to potential criminals by endangering their future work prospects and thus act as a crime deterrent. Public criminal records could also act as a deterrent through fear of expulsion from socially rewarding networks. On the other hand, online criminal records may make it difficult for ex-convicts to find legitimate employment and lead to higher recidivism rates. This theoretical tradeoff between deterrence and recidivism is precisely why the topic of public criminal records is highly debated among public policy makers, the media, and legal scholars, but thus far there has been no empirical evidence on what the actual impact of public records is on crime. This paper examines the trade-off between deterrence and recidivism brought by public electronic access to criminal records, in a context of direct interest to policy makers.

There are a number of reasons to believe that public access to criminal information may affect criminal behavior. First, existing research (utilizing experiments or longitudinal data combined with instruments) suggests there is a causal and negative impact of a criminal record on employment and wages (Kling 1999; Pager 2003; Finlay 2008). Holzer et al. (2004) survey more than 3000 establishments in metropolitan areas and show that most employers eschew hiring someone with a criminal history. From a theoretical viewpoint, the role of the social stigma from a criminal record could also act as a deterrent (Rasmusen 1996).

Second, since the late 1990s, a number of states began to publish criminal information of ex-offenders online. These databases are easily accessible to anyone with an Internet connection, and represent a large drop in the cost and effort required of obtaining criminal background information on another person. Before the introduction of online criminal history

websites, state background checks were significantly harder to obtain (Silverman 2004; Winn 2004). Depending on the state, one might have had to go from county to county to obtain court records manually. While some state police departments do offer centralized paper-based background checks, the procedures can be complicated and requests take up to several weeks to process. Other states maintain a closed records policy and provide no access to criminal records at all.[1]

Third, employers are increasingly taking advantage of the wired nature of the labor market to screen job applicants (Autor 2001). Although there is no state panel data on the number of record checks requested, anecdotal evidence indicate these websites gained widespread traction among both the public and employers quickly.[2] One reason for their rapid uptake is because a growing proportion of employers are mandated to screen their applicants, including most health professions and licensed occupations. Even for employers who are not legally obligated to perform them, background checks have become a routine procedure (Holzer et al. 2004). The growing number of negligence suits that place liability on employers have led them to become increasingly cautious about whom they hire (Harris and Keller 2004).

Given the compelling reasons that potential criminals would respond to incentives created by the posting of criminal records online, what does it imply for recidivism? Recidivism, in a criminal justice context, can be defined as the reversion of an individual to criminal behavior after he or she has been through the correctional system (Maltz 2001). As the title of the paper suggests, a criminal record can stigmatize as a modern day "scarlet letter" and thus operate as an

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[1] A number of state police departments do not provide background checks unless accompanied by notarized authorized release of the subject. Other states require fingerprints for official state background checks and do not offer name-based checks.

[2] For example, the state of Washington conducted 170,532 queries in 1998 when its website was introduced, and the number rose to 793,613 by 2003 (Washington State Bureau of Investigation, article available at http://washingtontechnology.com/articles/1998/07/17/washington-states-lucrative-history-lesson.aspx). Florida gets around 2 million searches per year and Pennsylvania gets 800,000 searches per year ("More Prisoners, parolees listed on Web", Associated Press Online, by Ian Hopper)

informal sanction and deterrent. On the flip side, it may drive an ex-convict towards recidivism because of diminished employment opportunities or wage penalties (Funk 2004). Empirical studies of ex-offenders emphasize the role of legal employment in keeping ex-offenders from recidivating (Berk et al. 1980, Uggen 2000). If the substantial expansion of criminal information to the public does hinder ex-offenders from obtaining legal employment, as evidence suggests, then online criminal records may lead to higher recidivism rates.

This paper exploits plausibly exogenous variation in the geographic rollout of online criminal record websites to explore how increased public access to criminal information impacts overall crime and recidivism. Using state-year panel data from the FBI Uniform Crime Reporting Program for the years 1990-2008, in conjunction with the timing of the release of online criminal databases, I examine the effect of online records on aggregate property and violent crime rates. I find a negative and significant effect of approximately 2.5 percent in property crime. This is a relatively small effect compared to other crime deterrent mechanisms found in the literature. The effect on violent crime, while negative, is not statistically distinguishable from zero. To test whether the reduction is crime is in fact brought about by public access to criminal records, I utilize the fact that juvenile criminal records are withheld from the public in most states. Using arrest rates summarized by race and adult status, I examine whether online criminal records affect criminal behavior in youth under the age of majority in states where juvenile records are kept confidential. Reassuringly, I find small and statistically insignificant effects for these juvenile cohorts. Further, I find an overall negative impact on arrest rates for both adult and juvenile groups for states that do publish juvenile records, which is consistent with the interpretation that the effect is through the expansion of online criminal information.

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Next, I investigate the impact of online criminal records on recidivism. Official state recidivism rates are unavailable as there is no central repository of data as there is for overall crime rates, and the majority of states do not collect annual recidivism rates. To cope with the lack of recidivism data, I utilize data from the Department of Justice National Corrections Reporting Program, which contains information about whether the prisoner had a felony conviction prior to his release and also tracks parolee exits. The impact on recidivism is explored in two ways. First, I measure recidivism as a prisoner being admitted with a prior felony record, and examine whether that likelihood is higher due to the publishing of online criminal records. I also examine whether online records increase the probability of parolees of being readmitted to prison. The results show that consistent with theory, increased public access to criminal records is associated with higher recidivism – I find that a prisoner admitted is approximately 11 percent more likely to have a prior felony record and a parolee is 10 percent more likely to be returned to prison. These results are robust to controlling for a host of individual characteristics and prison conditions, as well as the implementation of the three-strike laws across states in the 1990s. I also demonstrate that the recidivism results are not driven by selection of a "worse" mix of criminals, where first-time offenders are being deterred and the behavior of repeat offenders are unaffected. A back-of-the-envelope decomposition combining the result of 2.5% reduction in net crime and 11% increase in the likelihood of recidivism among ex-offenders would yield that online criminal records led to an overall reduction of approximately 8.7% for crimes among first-time offenders.

This paper contributes to the literature in several ways. First, this paper is to my knowledge one of the few studies examining the determinants of recidivism using recent data

that is close to a national scale.[3] Previous work on recidivism is sparse mainly because data

sources are limited as previously mentioned. It is important to study the determinants of

recidivism because the rates of recidivism are the United States are high – a conservative

estimate is that one out of three released prisoners return to prison within three years (Langan

and Levin 2002), causing the U.S. to have the highest correctional population in the world

despite falling crime rates since the 1990s. Are released prisoners recidivating because they are

irrational career criminals or are there ways to rehabilitate them? My results provide evidence

that recidivism does respond in a way that is consistent with rational behavior. Second, this

paper provides empirical evidence towards an ongoing policy debate. The results also highlight

that the incentives facing a first time offender and an ex-offender could be very different; the

dynamic nature of criminal behavior over the lifetime is something that has not been sufficiently

addressed in the literature. In this case, the same policy of public access to criminal information

could be a double edged sword.   Finally, expanding public access to information is especially

deserving of study as a potential policy to deter crime as it is inexpensive to host records online,

relative to other deterrence mechanisms such as incarceration.

The paper proceeds as follows. Section 2 provides a brief history of the different types of

background checks available by state, and the motivation behind the launching of such websites.

Section 3 describes the data. Section 4 presents the empirical strategy and results on overall

crime. Section 5 presents the empirical strategy and results on recidivism. Section 6 concludes.

2.   Background on Online Criminal Databases

Within a state, I describe three possible channels through which one could gain electronic

access to criminal records. From the public's perspective, the information provided through

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[3] Existing related studies that study post-release behavior of criminals that rely on data from a single state or jurisdiction are Kuziemko (2007), Owens (2009), Lee and McCrary (2009).

these channels are the same. For states which provide access to criminal records through one or more channels, I consider the channel which was introduced earliest. Table 1 provides the earliest year and the agency that provides the offender information for each state. The earliest that a state began to post criminal records on the Internet is Florida in 1997, and the most recent state in the sample to do so is Vermont in 2008. As it can be seen from Figure 1, there is substantial variation in the timing and the channel through which state criminal records were made online.

The first channel to obtain criminal background records is the "official" route, provided by the State Police Bureau or the Department of Public Safety. This channel requires the person requesting the information to provide at least the full name of the individual of interest, and usually the date of birth, and to pay a fee ranging from under $10 to $25 (see Appendix Figure 1 for an example of one of these websites). The rationale for placing offender records on the Internet for this channel appears to stem from the passage of the Brady Handgun Act in 1993 that required states to automate criminal records in order to facilitate background checks for gun purchasers. Certain states, in particular those that had statutes allowing members of the public to request criminal records (of other people) from the police department, eventually moved criminal records onto the internet to minimize transaction costs. This could also been seen as part of an overall trend in recent years of government agencies striving to be more transparent by posting information the public have access rights to online, including real estate and vital (birth and death) records.

The second channel through which to obtain criminal history information is through the Department of Corrections (DOC), where some states post records of all previously incarcerated

persons.[4] While these records are unofficial,[5] they provide essentially the same or more detailed

information as a criminal record check obtained from the state police department, including past

offenses, date of birth, incarceration history, and sometimes even photographs and tattoo details

of the offender. These searches are always free (see Appendix Figure 2). The primary motive

behind these websites seems to be public safety, and to provide peace of mind for past victims of

crime by allowing them to keep tabs on the status of offenders (New York State Department of

Corrections).

       The third channel I consider is through the state Administrator of Courts (AOC). A

number of states have placed court records online, which (often but not always) include criminal

records. A case search can be performed based on name alone, and the records contain enough

details to ascertain the offense type, name, race, date of birth of the person (see Appendix Figure

3). A few states charge a small fee, but most provide access for free. For online court records,

the migration from paper to electronic appeared to be driven mainly by the desire to streamline

the court system for both court users and administrators, which would explain why in most states

the posting of court records was accompanied by other technological advances such as electronic

filing. Another reason that is frequently mentioned in the law literature is to improve the

transparency of the judicial process (Winn 2004, Sudbeck 2006). I only take into account states

which have centralized case search websites, as opposed to states which have internet case

searches for individual counties.

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[4] A number of states post information only on currently incarcerated or supervised populations, which is not suited for the purpose of this paper. The state DOC does not include federal prisons. There is a separate website administered by the Federal Bureau of Prisons which contains limited information on prisoners released from federal prisons.

[5] These records are unofficial in the sense that one cannot apply for government documents (for example, work visas) using a printout from the website.

3.   Data and Descriptive Statistics

I collected the data on Internet access to criminal records from several sources. Non-profit research centers such as the Legal Action Center (LAC) and the SEARCH group, have compiled data on the availability of criminal history records to the public for a number of years. The main document that I focus on is the State Criminal History Record Information Availability Survey compiled by the SEARCH group of the National Consortium for Justice Information and Statistics in 2006. The document lists the state police departments that offer public access to criminal records and the states that offer official online criminal record searches. Based on this list, I contacted each department in charge and inquired about the year the internet search became available. Next, I checked the Department of Corrections and Administrator of Courts websites for each state to see what kind of records are available, and if criminal records were available, I contacted the relevant department to ascertain the year the website was launched. In all cases I am able to corroborate the timing of the launchings with news articles and official department press releases.[6]

To investigate the net impact on crime, I rely on aggregate crime rates and arrest data from the FBI Uniform Crime Reporting (UCR) Program for the years 1990 to 2008. The UCR Program tracks seven index crimes, which include criminal homicide, rape, robbery, aggravated assault, burglary, larceny, and motor vehicle theft. The first four crimes are considered violent crimes and the rest property crimes. These seven index crimes were chosen because they occur with regularity in all areas of the country and are most likely to be reported to police. I examine the effect of online records on aggregate property and violent crimes as separate categories, and also each specific crime within in my main analysis. Since crime rates are not broken down by

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[6] My data generally matches Finlay (2004), who examines the impact of internet access to criminal records on employment of offenders versus non-offenders using data from the NLSY97. However, Finlay misses a number of states which launched online access during his sample period.

age group, I use arrest rates which are summarized by age group, race, and offense type for the robustness check, which exploits the fact that some states do not publish juvenile records. Table 2 (Panel A) provides summary statistics for the seven index crimes. Appendix Table 1 gives the mean and standard deviation of the arrest rates for offenses used in the robustness check.

Next, I augment the crime data with demographic data from the U.S. Census Bureau Population Estimates. Education levels are estimated using the annual CPS March supplements (King et al., 2010). Unemployment rates and disposable income data are obtained from the Bureau of Labor Statistics and Bureau of Economic Analysis, respectively. State justice employment and expenditure data are extracted from the Annual Government Finance Survey and the Annual Survey of Public Employment. These variables are intended to capture time-varying state-level characteristics that may impact criminal behavior.

The second part of the empirical analysis focuses on the effect of posting criminal records on the Internet on the probability of recidivism of ex-offenders. Previous work on recidivism is sparse because comprehensive data on the subject is unavailable as discussed in the introduction. Moreover, because there is no uniform definition of recidivism, the limited recidivism rates published by state agencies cannot be compared directly. I cope with the lack of actual recidivism data by utilizing the National Corrections Reporting Program (NCRP) data. The NCRP is produced under the Bureau of Justice Statistics, and gathers data on prisoners entering and leaving the custody of state authorities. The program is comprised of three separate sets of data: prisoners who were admitted to prison (Part 1), released from prison (Part 2), or released from parole (Part 3). The NCRP collects demographic information, conviction offenses, sentence length, year and type of admission, year and type of release, and time served from individual prisoner records in 41 participating jurisdictions.

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Critically, the data on released prisoners contain information on whether the prisoner has a prior felony conviction. I utilize this information to define the individual as a recidivist if he had a prior felony conviction and is committed to prison with a new sentence (reconviction).[7] I define a second recidivism variable using the parolee exit data, which is unity if the parolee is returned to prison (reincarceration). Unfortunately, some of the states did not differentiate between the parolee being returned to prison for a technical parole violation versus a new sentence, and as such may not accurately capture recidivism since parole violations do not necessarily involve criminal behavior. The results using this second definition of recidivism variable using the parolee data should therefore be interpreted more as a robustness check.

This paper utilizes the prisoners released and parolee exit data from 1998, 1999, 2001, and 2004.[8] I combine the prisoners released data to create a panel of prisoners who were admitted from the years 1990 to 2004. Similarly, I pool the 4 years of parolees exit data to generate a dataset of prisoners released on parole from 1990 to 2004. Panels B and C of Table 1 presents summary statistics of key variables from the prisoners released data and parolee exits data, respectively. Encouragingly, the statistics from Panel B and C are comparable. This is perhaps not a surprise, since close to 80 percent of all prisoners are now released on parole. More than a quarter of prisoners admitted were recidivists in that they had a prior felony record (Panel B), and around 25 percent of parolees do not complete parole successfully and are returned to prison (Panel C). These numbers are consistent with the previous studies of recidivism. For example, among nearly 300,000 prisoners released in 15 States in 1994, 25.4%

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[7] The Bureau of Justice Statistics has three definitions of recidivism: rearrest, reconviction, and reincarceration (Langan and Levin 2002). This paper uses the latter two definitions.

[8] 2004 is the latest year, and currently the only downloadable dataset at ICPSR (http://www.icpsr.umich.edu/cocoon/NACJD/STUDY/26521.xml). All data from previous years are restricted and the only other years I am able to gain access to are 1998, 1999, and 2001.

were resentenced to prison within 3 years from their release (Langan & Levin 2002). The

characteristics of prisoners in Panels B and C are also comparable: almost all of the prisoners are

male; close to half are black; and less than 1 percent of prisoners have a college degree.

Using NCRP data to investigate recidivism is not without its limitations. The main

drawback is the lack of complete criminal history – there is no information on the number of

prior felony records, the type of offense the prior felony conviction was for, or when the prior

felony was committed. It would be instructive to understand which types of offenders are being

affected by the provision of online criminal records. Nonetheless, this paper is to my knowledge

one of the few studies examining recidivism using recent data that is close to a national scale.

4.   Effect of Online Criminal Records on Overall Crime

4.1   Estimating Equation – Overall Crime

The first part of the empirical analysis examines the net effect of online criminal records

on aggregate crime rates. The regression framework is as follow:

$$Crime_{st} = \gamma_s + \delta_t + \beta Online\_Records_{st} + X'_{st}\theta + \varepsilon_{st} \qquad (1)$$

where $Crime_{st}$ is the number of crimes per 100,000 persons, and $Online\_Records_{st}$ is a dummy

variable indicating whether the state has begun offering internet access to criminal records in

state *s* by year *t*. γ_s and δ_t are the state and year fixed effects, respectively. X_{st} includes a set

of state-specific demographic, economic, and education controls, including the percentage of

state population under the poverty line, inflation-adjusted disposable income per capita,

unemployment rate, police employment and expenditures per capita, and also percent of

population with a high school degree, some college education, college and beyond. ε_{st} is the

usual error term. β is then the coefficient of interest – it assesses whether providing internet

access to criminal records causes a deviation from a state's mean of arrest rate relative to other states where criminal records have yet to be posted online.

4.2   Endogeneity of Timing

The natural concern with using a differences-in-differences approach is endogeneity in the timing of such changes to identify their causal effects, i.e., there are factors not controlled for in Equation (1) that are correlated with state agencies' decision to place records online. I argue that endogeneity is unlikely to be a problem in this context for a few reasons. First, in most states the provision of records on the Internet was not mandated by the passage of new laws. Rather, the actual laws that permit public access to records have existed for many years, but the actual costs of accessing the records still remain high (i.e., one has to physically visit individual courthouse to search for records). Further, there is considerable variation in the number of years between the enactment of public access laws and when records went online.[9] The lateral movement from paper to online appeared to have been governed by factors that had little to do with policies directly related to crime.

Second, I utilize a combination of independent agencies that provide records online, which should limit the problem of endogeneity. Strikingly, there is no state where all three agencies provide access to criminal records simultaneously. Further, there are several states where the procedure of obtaining an official "paper" background check is considerably involved, i.e., it requires fingerprints, notarized release forms, and more than several weeks to process, but court records or DOC records are freely available online. For example, Arizona is a closed records state where official background checks are restricted to justice-authorized agencies, but, in 2000, was one of the first states to put criminal history of previously incarcerated felons on their Department of Corrections website. New York presents a similar example.

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[9] The specific state statutes regulating public access to criminal records can be obtained from the author by request.

To empirically address the concern of endogeneity, I regress (1 if yes, 0 otherwise) the

state's provision of criminal records online, on a host of state demographic and socioeconomic

characteristics, and up to 4 lags of violent and property crime rates. The coefficients on the

crime rates are all very close to zero (not reported). When the composition of state legislatures

by political party affiliation to control for political attitudes are added, the only coefficients that

are statistically significant (at the 10 percent level) are those on the percent of the lower and

upper house State Senate democrats. Interestingly, the effect of the percent of lower house

Democrats is positive at 0.6 percentage points, whereas the coefficient on upper house

Democrats is negative at 1.29 percentage points. Overall, it does not appear that the decision of

state agencies to place criminal records online was driven by rising crime rates or particular

political attitudes. One variable that does seem to be positively correlated with the introduction

of these websites is the number of high-speed internet providers per capita. However, the effect

is small – the regression coefficient suggests that when the number of high speed providers per

capita doubles, the probability that a state provides online criminal records increases by 1

percentage point.[10]

4.3   Results on Overall Crime

I begin by examining the impact of providing internet access to criminal records to the

public on aggregate property crime rates (Table 3). Robust standard errors (presented in

parentheses) are clustered by state, following Bertrand et al. (2004). Column (1) is the basic

difference-in-difference regression. Controlling only for state and year fixed effects, the result

indicates that providing internet access to criminal records significantly reduced the number of

property crimes per 100,000 peoples by around 190 incidents. The next column (Column 2)

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[10] One may be concerned that it is improving internet technology that is driving the reduction in crime. However, there should not be the observed increase in recidivism if that is the case.

adds on state level time-varying controls which may be correlated with crime. The coefficient on

Online_Records remains close to before and statistically significant. Column (3) allows for

region-by-year fixed effects to capture any non-linear evolution of crime rates common to states

in the same Census region. Column (3) also includes a falsification test by including a placebo

dummy set to one three years before the criminal database was launched in that state.

Reassuringly, the coefficient of the dummy is small and insignificant, implying that reduction in

crime rates is not picking up some other intervention that may have preceded the rollout of the

databases. Columns (4)-(6) repeats the same specifications used in Columns (1)-(3) but with log

rates as the dependent variable. The results suggest that online records led to an approximate

2.5-3 percent reduction in property crime. Given the highly right-skewed nature of the data, I

also present results using Poisson estimations with the number of crimes as the dependent

variable in Columns (7)-(9).[11] The results are similar – there is roughly a 3 percent drop in

property crime associated with online records.

     Next, I examine the effect on specific property crimes (Table 4). I find a significant

reduction in burglary of 82 incidents per 100,000 population, and a reduction in larceny of 145

incidents per 100,000 population. The reduction in burglary corresponds to an approximate 4.3-

4.8 percent drop (Columns 4 & 7). However, the effect is less conclusive in regards to larceny –

the estimate on larceny is not statistically different from zero when using log rates (Column 5),

but yields an estimate of -4.1 percent (statistically significant at 10 percent) when using a

Poisson model (Column 7). There is no discernible impact on car theft regardless of

specification.[12]

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[11] All Poisson estimations use population as the exposure variable.

[12] One explanation for the lack of effect on auto theft could be that the arrest rate for car theft is relatively low (see Appendix Table 1), implying that potential car theft criminals could be less deterred than for crimes with higher probabilities of arrest.

Is there any impact of online criminal records on violent crimes? The results in Table 5 show negative coefficients but statistically insignificant results. The incidence rates of violent crimes are much lower, which is one reason why the estimates are imprecise. The Poisson estimates (Columns 7-9) may be more reliable in the case of violent crimes because of the low incidence rates. Although the estimates still lack desired levels of precision, the coefficients are very close to zero and are statistically different from the estimates with property crimes as the dependent variable (at the 10 percent level).

These results are consistent with the existing literature, where most studies find a positive relationship between deterrent mechanisms and property crime and a much weaker relationship with violent crime (see Freeman 1999, Levitt and Miles 2007 for a review). Recent research also points to information networks and peer effects as important determinants of the decision to commit crime (Williams and Sickles 2002; Bayer et al. 2009). Indeed, it is plausible that individuals who are surrounded by peers who tend to commit crime are *more* aware of the introduction of online criminal databases and their negative repercussions.

Compared to the existing literature on crime deterrence mechanisms, the deterrence effect found in this paper appears relatively small.[13] Helland and Tabarrok (2007) exploit the three strikes legislation in California to compare the group of criminals with two strikes with the control group of those who were tried for a second strikeable offense but convicted of a non-strikeable offense. They find that California's three strike legislation significantly reduces felony arrest rates among the class of criminals with two strikes by 17-20 percent. In related work, Kessler and Levitt (1999) estimate a deterrent effect of sentence enhancements using

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[13] It is somewhat difficult to compare the results of this paper directly to the existing literature on deterrence mechanisms, since this paper relies mainly on a dichotomous change in a policy, whereas most other papers examine changes in variables (for example, size of police force or expected sentence length) that permit an elasticity calculation (e.g. a 1 percent increase in expected sentence corresponds to *x* percent drop in crime).

California's Proposition 8, and find a reduction in eligible crimes by 4 percent in the year

following its passage and 8 percent 3 years after its passage. Policy-wise, perhaps the most

comparable paper to this is the forthcoming paper by Prescott and Rockoff (2010), who examine

the impact of sex offender registration and notification laws on criminal behavior. Overall, they

estimate that putting a notification law in place deters -1.07 yearly sex offenses per 10,000

people, which represents approximately an 11 percent reduction.

<u>4.4   Robustness Check</u>

Most states keep juvenile criminal records confidential, meaning that juvenile records

cannot be accessed by anyone except for select justice agencies. If the mechanism is indeed

through which the provision of online criminal records, then there should not be an observed

impact on crime committed by juveniles. Table 6 exploits the differential treatment of juvenile

records to present a simple robustness check using UCR arrest data. Arrest data of related

property crimes, which are summarized by adult status, race, and offense (see Appendix Table 1)

are used because crime rates are not broken down by age group. The estimating equation in

Table 6 is essentially a modification of Equation 1 into a triple-differences (DDD) approach:

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\begin{aligned}
Arrest_{orst} = \beta_1 Online\_Records_{st} + \beta_2 Adult + \beta_3 Online\_Records_{st} * Adult + \rho_o + \alpha_r \\
+ \gamma_s + \delta_t + X'_{rst}\theta + \varepsilon_{orst} \qquad\qquad (3)
\end{aligned}
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where $Arrest_{orst}$ is the arrest rate for the adult/juvenile group, of race r, offense o, in state s and

year t. $\alpha_r, \rho_o, \gamma_s, \delta_t$ and are the race, offense, state, and year fixed effects, respectively. β_1

measures the overall impact of internet access to criminal records on juveniles. β_3 measures the

differential impact of access to criminal records for offenses committed by adults. The sum of

the two coefficients (β_1 and β_3) then represents the effect of online records on adults. The

sample in Columns (1) and (2) consists of states that do not release juvenile criminal records to

the public. The estimates imply that online records decreased arrests among adults by around 15

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per 100,000 in the population, which represents around a 4 percent reduction. At the same time, β_1 is small and insignificant, suggesting that there is little negative effect on arrest rates of juveniles.

Using juveniles as a control group would not be valid if they do not respond as adults do to deterrence incentives, for example, because of shorter time horizons (Lee and McCrary 2010). However, Mocan and Rees (2005), using microdata from the National Longitudinal Study of Adolescent Health, find that juveniles do respond to incentives and sanctions as predicted by economic theory: employment opportunities, increased family income and stricter punishments are effective tools in reducing juvenile crime. Levitt (1998) find a large negative elasticity of -0.40 with respect to sentence punitiveness. Nonetheless, I address this concern by running a second robustness check. If it were the case that juveniles will not be deterred by online criminal records, then I should find similar results to those in the first two columns of Table 6 for states that *do* publish juvenile records. Columns (3) and (4) of Table 6 presents the results for estimating Equation (3) using only the sample of states that publish juvenile records. Interestingly, for these states, β_1 becomes negative and statistically significant (at the 10 percent level), whereas β_3 is statistically insignificant, implying that in states that publish juvenile records, there is a uniformly negative deterrent effect on both adults and juveniles alike, with little difference in impact for the two broad groups. Taken together, the results from Table 6 provide corroborative evidence that the driving mechanism in the reduction in crime is indeed through the online provision of criminal records.

5.   Effect of Online Criminal Records on Recidivism

5.1   Estimating Equation - Recidivism

The next portion of the empirical analysis focuses on the effect of online criminal records

on recidivism. Ideally, the time ex-felons spend in prison rehabilitates them so that they return to their communities as productive citizens. However, if the publishing of criminal background information online impedes ex-felons from finding legitimate employment, or cause them to suffer a large wage discount, the benefits of repeat criminal behavior could outweigh the costs.[14] There could thus be an important trade-off between the deterrent effect of public access to criminal records and higher recidivism rates.

Using the NCRP prisoners released data (described in Section 3), I first define an individual to be a recidivist if he had a previous felony and is readmitted to prison with a new sentence.[15] The estimating equation is:

$$Recidivist1_{itsa} = \alpha_s + \gamma_a + \delta_t + \beta Online\_Records_{sa} + X'_{isa}\Gamma + W'_{sa}\Pi + \varepsilon_{itsa} \qquad (3)$$

$\alpha_s, \gamma_a, \delta_t$ are state, year of prison admission, and years served in prison fixed effects, respectively. X'_{isa} is a vector of individual controls, including race, educational attainment, age and age squared at year of admission, whether the most serious offense (for the current sentence) was a violent, property, or drug crime, sentence length in months (plus squared term). I also include a dummy which controls for the enactment of the three-strikes law across states. As in previous regressions, state-year controls in W'_{sa} consist of the unemployment rate, disposable income per capita, and law enforcement employment and expenditures per capita. β hence measures whether an admitted prisoner is *more likely to be a recidivist* after the provision of online criminal records in a state, relative to other states where criminal records have yet to be posted online.

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[14] This intuitive idea is explored in more detail through a theoretical framework by Funk (2004). In her model, it remains unclear what kind of policy in regards to the privacy of criminal records is most beneficial in terms of crime reduction. She shows the only way to guarantee the effectiveness of stigma is to supplement it with harsh enough punishment for repeat offenders.

[15] For example, under this definition, a person with a previous felony incarceration record but is admitted into prison as a transfer with no new sentence would not count as a recidivist.

As a robustness check, I utilize the NCRP parolee exit data to define a second recidivism variable ($Recidivist2$) as the probability the parolee is discharged by being returned to prison, based on year of release from prison:

$$Recidivist2_{itpsr} = \alpha_s + \gamma_r + \delta_t + \theta_p + \beta Online\_Records_{sr} + X'_{isr}\Gamma + W'_{sr}\Pi + \varepsilon_{itpsr} \quad (4)$$

$\alpha_s, \gamma_r, \delta_t, \theta_p$ are state, year of prison release, years served in prison, and years served on parole fixed effects, respectively. X'_{isa} is a vector of individual level controls, including race, educational attainment, age and age squared at year of release, whether the most serious offense was a violent, property, or drug crime, sentence length in months (plus squared term), whether the individual was released on mandatory parole (i.e., released from prison to parole supervision by virtue of statutes that determine the length of time prisoners are incarcerated instead of a parole board decision), and whether supervision status at time of release of the individual is active or out-of-state. The state-year controls in W'_{sr} are the same as in the previous regression. β assesses whether a prisoner released in year r is more likely to be returned to prison due to the provision of online criminal records.

5.2   Results on Recidivism

Table 7 presents the results from estimating Equation (3) as a linear probability model, where recidivism is measured by the probability the prisoner admitted with a new sentence has a prior felony record.[16] The first column includes only personal characteristics as controls, and the coefficient on the Internet dummy is 0.0392, from the mean recidivism rate of 0.285. Layering on state-year controls and adding region-year fixed in Columns (2) and (3) leaves the estimate in the range of 0.032 to 0.040. Using the most conservative estimate would imply that recidivism increased by around 11 percent. Column (4) is the same specification as Column (3) but also

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[16] Results using probit and logit models with fixed effects yield very similar results and are available upon request.

includes a placebo dummy set at unity three years before the actual launch year. The estimate of the placebo dummy is small and insignificant. The results imply that expanding public access to criminal information is associated with higher recidivism rates, insofar as the prisoner admitted is more likely to be a repeat offender in states after criminal records are published online.

The results from estimating Equation (4), where recidivism is defined as reincarceration, support those from Equation (3). As in Table 7, the first column in Table 8 includes only personal characteristics as controls, and the coefficient on the *Online_Records* dummy is 0.0365, from the mean rate of reincarceration of 0.26. The magnitude of the estimate decreases, but become more statistically significant, with the addition of a host of state year controls, as well as region-year fixed effects. The inclusion of the placebo dummy in Column (4) leaves the coefficient on *Online_Records* almost unchanged from Column (3) at 0.0262.

The results from Tables 7 and 8 reveal that expanding public access to criminal information is associated with increased recidivism rates. Several large scale experimental work programs pioneered by sociologists that targeted ex-offenders in the 1970-80s have demonstrated that employment helps keep ex-offenders from recidivating. Through the Transitional Aid Research Project, Berk et al. (1980) find that each week of employment reduces the number of arrests among ex-offenders by 0.03. In the National Supported Work Demonstration Project, ex-offenders were randomly assigned to treatment and control groups, where those in the treatment group were offered minimum wage jobs. Uggen (2000) finds that the treatment lowered the probability of arrest by approximately 22%. In addition to the evidence that having a criminal record hurts employment opportunities substantially, the results on recidivism of this paper are certainly not unreasonable. Further, the results from this paper, both on overall crime and recidivism, are consistent with the findings of Prescott and Rockoff (2010), who investigate the

impact of registration and notification laws on sex offenses. They find that community notification deters first-time sex offenses, but increases recidivism by registered offenders.[17]

5.3 Are the Results Driven by Selection?

One way I define recidivism is as the probability of an admitted prisoner having a prior felony conviction, which could lead to concerns that the result of higher recidivism is driven by selection. If first time offenders are now being deterred, then the pool of prisoner admissions would be comprised of a "worse" mix, i.e., a larger proportion of repeat offenders versus first time offenders, which would lead to higher recidivism even without changes in criminal behavior of repeat offenders.

I present a back-of-the-envelope exercise to show that the mechanism driving the recidivism result is not selection. Suppose the extreme case that ex-offenders are not affected at all, which would imply the reduction of crime of roughly 2.5% takes place entirely among first time offenders. Assuming that prior to the introduction of online criminal records 1/3 of criminals are recidivists (a generally accepted recidivism statistic), then the introduction of online records would reduce the number of first time offenders to $X * 2/3 * 0.975 = 0.65X$, where X is the initial total criminal population. The number of recidivists remains at 1/3 X. This would lead the proportion of repeat offenders admitted to prison to become $1/3X/(1/3X + 0.65X) = 0.3389$, i.e., there should only be a 0.56 percentage point increase. Given that I find an increase of around 3.6 percentage point in the probability of a prisoner admitted being a repeat offender, it cannot be that the mechanism driving my result is selection of prisoners admitted.

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[17] The authors do not have the actual recidivism rates of registered offenders. Instead, the authors interact the adoption of notification laws with the size of the sex offender registry as a proxy for recidivism. They find that the estimated coefficient on the interaction of the registry size and notification law is positive – i.e., while they find that notification is associated with a decrease in crime, the estimated effect for notification laws is weaker when there are a larger number of offenders on the registry. Their results provide corroborative evidence of the impact of online provision of information on criminal behavior found in this paper.

However, my result could be upward biased (with an upper bound of around 0.56 percentage points based on this exercise).

<u>5.4   Impact on First-Time Offenders</u>

How does the introduction of online criminal records affect first-time offenders given the results on net crime and recidivism? A rough estimate of the impact can be backed out through the following calculation. First, I find a 2.5 percent reduction in net property crime, which represents a drop of 166 crimes per 100,000 population (Table 3). This implies that the number of crimes prior to the introduction of criminal records, which is comprised of first time offenses and repeat offenses, is 6640 (=166/0.025) per 100,000 population. Next, assuming again that a third of crimes are committed by recidivists prior to the introduction of online criminal records, then the number of first time offenses would be 4427 (= 6640 – 6640 * 1/3). After the introduction of online criminal records, the probability of recidivism increased by approximately 10% and net crime reduced by 2.5%, which would yield that first time offenses fell to 4039 (= (6640 – 166) – 1/3 * 6640 * 1.1). This implies that first time offenses reduced by approximately 8.7 percent.

6.   Conclusion

Using stigma as a deterrence device is by no means a new technology – the method of public shaming has been used since ancient times. For example, scars and branding have traditionally been used as a form of indelible criminal record. What are the ramifications of the modern day scarlet letter? While part of the intended purpose of providing Internet access to criminal records is to improve public safety, the actual impact has never been fully evaluated. This paper provides the first attempt at examining the effect of expanding public access to criminal history through online records on overall crime and recidivism. I find that placing

records online leads to a net reduction in property crimes of approximately 2.5 percent. This reduction can be interpreted to be among first-time offenders. A back-of-the-envelope calculation based on cost per crime estimates in Miller et al. (1996), suggests that the net benefit associated with the introduction of online criminal records is roughly $2.13 (in 2009 dollars) per person.
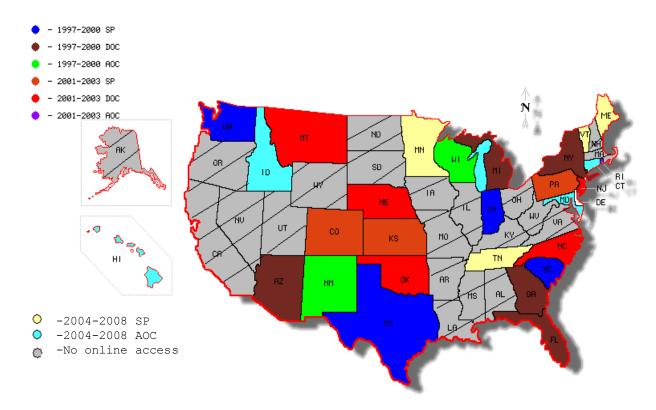
As the results of this paper imply, however, the unintended consequences of allowing widespread access to criminal records are higher recidivism rates among ex-offenders. I find that the probability of recidivism among ex-offenders rises by slightly more than 10 percent. Putting the results on net crime and recidivism together would imply that there is an 8.7 percent reduction in crime among first-time offenders. Although crime rates have been falling since the early 1990s, prison population has been escalating in part due to the so-called "revolving door" phenomenon of correctional system. Further, given the high proportion of disadvantaged black males among the offender population, and the evidence that having a criminal record hurts blacks more than whites (Pager 2003), allowing widespread access to criminal records may not help achieve the economic goal of equity. Thus, while public access to criminal records may be a cost-effective method of deterring first-time offenders, a broader examination of the social costs as related to ex-offenders is needed.

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Figure 1. Timing of Online Criminal Records, 1990-2008

States shaded in grey do not have public electronic access to criminal records.
(SP = State Police, DOC = Department of Corrections, AOC = Administrator of Courts)

Table 2. Summary Statistics of Selected Variables

Variable	Mean	Standard Deviation
Panel A: Aggregate Crime Rates		
Violent Crime Rate	497.5	(322.0)
Murder	6.58	(7.74)
Rape	36.32	(12.95)
Robbery	142.71	(141.10)
Aggravated Assault	311.8	(189.2)
Property Crime Rate	3947.4	(1157.6)
Burglary	836.2	(314.6)
Larceny	2696.5	(731.2)
Motor Vehicle Theft	414.7	(250.9)
Panel B: Reconviction		
Reconviction	0.285	(0.396)
Male	0.898	(0.303)
Black	0.454	(0.498)
Age at admission	32.55	(9.661)
Admitted for a Violent Crime	0.150	(0.357)
Admitted for a Property Crime	0.230	(0.421)
High school degree or GED	0.186	(0.389)
College degree	0.005	(0.068)
Time served in prison (months)	19.81	(24.09)
Panel C: Rearrest		
Rearrest	0.256	(0.437)
Male	0.901	(0.299)
Black	0.423	(0.494)
Age at release	34.07	(9.053)
Admitted for a Violent Crime	0.160	(0.366)
Admitted for a Property Crime	0.240	(0.427)
High school degree or GED	0.112	(0.316)
College degree	0.002	(0.047)
Time served in prison (months)	18.73	(25.12)

Standard deviations are in parentheses.

Notes: Arrest rates are measured per 100,000 persons.

Sources for Panel A: Uniform Crime Reporting Program Data [United States], 1990-2008.

Source for Panel B: National Corrections Reporting Program Prisoners Released Data. 1998, 1999, 2001, 2004.

Source for Panel C: National Corrections RP Parolees Exit Data. 1998, 1999, 2001, 2004.

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Source for Panel C: National Corrections RP Parolees Exit Data. 1998, 1999, 2001, 2004.

Table 3. Impact of Online Criminal Records on Aggregate Property Crime Rates

	Property Crime Rate			Log(Property Crime Rate)			Poisson		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Online Records	-193.7**	-189.4**	-166.1**	-0.0325**	-0.0295**	-0.0252*	-0.0377*	-0.0317**	-0.0295**
	(88.89)	(84.38)	(72.35)	(0.0164)	(0.0144)	(0.0143)	(0.0226)	(0.0128)	(0.0136)
Placebo			-11.31			-0.00341			-6.74E-06
			(70.22)			(0.0162)			(0.0213)
Fixed Effects:									
State	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year	✓	✓	✓	✓	✓	✓	✓	✓	✓
Region*Year			✓			✓			✓
Controls		✓	✓		✓	✓		✓	✓
Observations	969	969	969	969	969	969	969	969	969

* significant at 10%   ** significant at 5%   *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the state/year level.

- Property crime rate = number of crimes per 100,000 population.

- Property crimes: burglary, larceny, motor vehicle theft.

- Placebo dummy is set to unity three years before the actual website launch.

- Controls include percent aged under 5, between 6 and 17, 45-64, and over 65, percent black, log(population), unemployment rate, log(real disposable income in 2000 $), percent under the poverty line, percent in metro area, percent with high school degree, some college education, college degree and beyond, number of police employed per capita, and police expenditures per capita (in 2000 $).

Source: Uniform Crime Annual Reports, 1990-2008.

Table 4. Impact of Online Criminal Records on Specific Property Crime Rates

	Property Crime Rate			Log(Property Crime Rate)			Poisson		
	Burglary	Larceny	Car Theft	Burglary	Larceny	Car Theft	Burglary	Larceny	Car Theft
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Online Records	-82.09***	-145.6**	-21.36	-0.048*	-0.025	-0.035	-0.043*	-0.041*	-0.013
	(23.05)	(56.34)	(22.47)	(0.027)	(0.019)	(0.048)	(0.023)	(0.021)	(0.049)
Obs	969	969	969	969	969	969	969	969	969

* significant at 10%   ** significant at 5%   *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the state/year level.

- Crime rate = number of crimes per 100,000 population.

- All regressions include state, year, region-year fixed effects, and a full set of controls.

- Controls include percent aged under 5, between 6 and 17, 45-64, and over 65, percent black, log(population), unemployment rate, log(real disposable income in 2000 $), percent under the poverty line, percent in metro area, percent with high school degree, some college education, college degree and beyond, number of police employed per capita, and police expenditures per capita (in 2000 $).

Source: Uniform Crime Annual Reports, 1990-2008.

Table 5. Impact of Online Criminal Records on Aggregate Violent Crime Rates

	Violent Crime Rate			Log(Violent Crime Rate)			Poisson		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Online Records	-15.58	-14.92	-13.72	-0.0194	-0.0202	-0.0157	-0.0076	-0.0057	-0.0046
	(24.22)	(23.06)	(19.21)	(0.0448)	(0.0445)	(0.0264)	(0.0255)	(0.0255)	(0.0240)
Placebo			8.59			0.00448			0.0009
			(21.34)			(0.0133)			(0.0256)
Fixed Effects:									
State	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year	✓	✓	✓	✓	✓	✓	✓	✓	✓
Region*Year			✓			✓			✓
Controls		✓	✓		✓	✓		✓	✓
Observations	969	969	969	969	969	969	969	969	969

* significant at 10%   ** significant at 5%   *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the state/year level.

- Violent crime Rate = number of crimes per 100,000 population.

- Violent crimes: intentional murder, rape, robbery, aggravated assault.

- Placebo dummy is set to unity three years before the actual website launch.

- Controls include percent aged under 5, between 6 and 17, 45-64, and over 65, percent black, log(population), unemployment rate, log(real disposable income in 2000 $), percent under the poverty line, percent in metro area, percent with high school degree, some college education, college degree and beyond, number of police employed per capita, and police expenditures per capita (in 2000 $).

Source: Uniform Crime Annual Reports, 1990-2008.

Table 6. Impact of Online Criminal Records on Juveniles versus Adults

Sample:	States that keep juvenile records confidential		States that release juvenile records	
	Arrest Rate	Log(Arrest Rate)	Arrest Rate	Log(Arrest Rate)
	(1)	(2)	(3)	(4)
Online Records	-1.341	0.0338	-19.29*	-0.0769*
	(22.47)	(0.120)	(11.20)	(0.0451)
Adult x Online Records	-14.49***	-0.0448**	6.169	0.00723
	(6.070)	(0.0194)	(29.32)	(0.0921)
Observations	88,264	88,264	12,228	12,228

* significant at 10%   ** significant at 5% *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the adult/race/offense/state/year level.

- All regressions include state, year, race, offense fixed effects, and a full set of controls.
- States which release juvenile records to the public: Idaho, Maine, Michigan, New Jersey, New Mexico, Pennsylvania, and Washington. All other states keep juvenile records confidential.
- Controls include unemployment rate, log(real disposable income in 2000 $), percent under the poverty line, percent in metro area, percent with high school degree, some college education, college degree and beyond by race, state, and year, number of police employed per capita, and police expenditures per capita (in 2000 $) by state and year.

Source: Uniform Crime Reporting Program Data [United States]: Arrests by Age, Race, and Offense, Summarized Yearly, 1990-2008.

Table 7. Impact of Online Criminal Records on Recidivism based on Prisoners Admitted from 1990-2004

Dependent Variable = 1 if Prisoner has a Prior Felony Record				
	(1)	(2)	(3)	(4)
Online Records	0.0392*	0.0407**	0.0321**	0.0382**
	(0.0215)	(0.0179)	(0.0157)	(0.0166)
Placebo				-0.0073
				(0.0125)
Fixed Effects:				
State & Year of Admission	✓	✓	✓	✓
Years served	✓	✓	✓	✓
Offense			✓	✓
Region*Year			✓	✓
Controls:		Individual State	Individual State	Individual State
Observations	1,124,329	1,124,329	1,124,329	1,124,329

* significant at 10%   ** significant at 5% *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the individual/state/year of admission level.

- The placebo dummy is set to unity three years before the actual website launch.

- Individual controls include: male, black, hispanic origin, age and age squared at year of prison admission, sentence length in months, sentence length in months squared, some high school, high school completion or GED, some college, or college degree.

- State controls include unemployment rate, log(population), log(real disposable income in 2000 $), number of police employed per capita, and police expenditures per capita (in 2000 $), number of correctional staff employed per capita, correctional expenditures per capita (in 2000 $), and whether the state has a three-strikes law.

Source: National Corrections Reporting Program Prisoners Released Data, 1998, 1999, 2001, 2004.

Table 8. Impact of Online Criminal Records on Recidivism based on Prisoners Released on Parole from 1990-2004

	Dependent Variable = 1 if Parolee is Returned to Prison			
	(1)	(2)	(3)	(4)
Online Records	0.0365*	0.0322**	0.0275**	0.0262**
	(0.0187)	(0.0152)	(0.0134)	(0.0123)
Placebo				-0.00263
				(0.0320)
Fixed Effects:				
State & Year of Release	✓	✓	✓	✓
Years served in Prison	✓	✓	✓	✓
Years served on Parole	✓	✓	✓	✓
Offense			✓	✓
Region*Year			✓	✓
Controls:		Individual State	Individual State	Individual State
Observations	929,473	929,473	929,473	929,473

* significant at 10% ** significant at 5% *** significant at 1%

- Robust standard errors are clustered at the state level. Unit of observation is at the individual/state/year of release level.
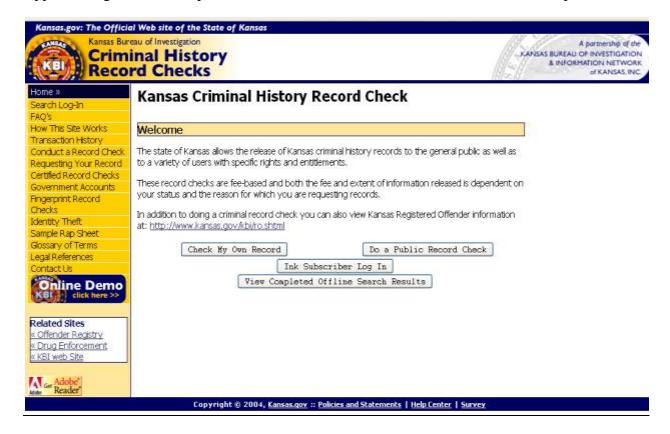
- The placebo dummy is set to unity three years before the actual website launch.

- Individual controls include: male, black, hispanic origin, age and age squared at year of prison admission, sentence length in months, sentence length in months squared, some high school, high school completion or GED, some college, or college degree.

- State controls include unemployment rate, log(population), log(real disposable income in 2000 $), number of police employed per capita, and police expenditures per capita (in 2000 $), number of correctional staff employed per capita, correctional expenditures per capita (in 2000 $), and whether the state has a three-strikes law.

Source: National Corrections Reporting Program Parolee Exit Data, 1998, 1999, 2001, 2004.

Appendix Table 1. Summary of Arrest Rates

Violent Crimes:	71.59 (149.46)	*Property Crimes:*	163.88 (322.68)
Intentional Murder	8.83 (18.26)	Burglary	130.51 (188.17)
Rape	19.71 (21.48)	Larceny	464.60 (489.35)
Robbery	51.19 (95.50)	Motor Vehicle Theft	53.55 (109.52)
Aggravated Assault	205.79 (232.61)		
Related Property Crimes:			
Forgery & Counterfeiting	45.15 (58.96)	Arson	5.58 (7.07)
Fraud	158.75 (299.07)	Embezzlement	6.87 (13.88)
Vandalism	134.77 (174.85)	Stolen Property - Buy or Receive	61.58 (95.97)

Standard deviations are in parentheses.

- Arrest rates are measured per 100,000 persons.

Source: Uniform Crime Reporting Program Data [United States]: Arrests by Age, Sex, and Race, Summarized Yearly. 1990-2008

Appendix Figure 1 – Example of Online Criminal Record Check via State Police Department

Appendix Figure 2. Online Criminal Record of Infamous Mobster John Gotti, via New York Department of Corrections

Appendix Figure 3. Example of Online Criminal Record Check via State Judiciary