Reducing Crime through Expungements

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Abstract

Expungements reduce the visibility of a person’s criminal record, and thereby reduce the informal sanctions that may be imposed on him. This reduction is enjoyed by the ex-convict only if he does not become a repeat offender, because otherwise he re-obtains a criminal record. Thus, the value a person attaches to having his record expunged is inversely related to his criminal tendency. Therefore, by making expungements costly, the criminal justice system can sort out low criminal tendency individuals—who are unlikely to recidivate—from people who have high criminal tendencies. Moreover, the availability of expungements does not substantially affect a first time offender’s incentive to commit crime, because one incurs a cost close to the reduction in informal sanctions that he enjoys by sealing his criminal record. On the other hand, expungements increase specific deterrence, because a person who has no visible record suffers informal sanctions if he is convicted a second time. Thus, perhaps counter-intuitively, allowing ex-convicts to seal their records at substantial costs reduces crime.

1. Introduction

Expungement refers to the legal practice of having one’s criminal record sealed such that it is inaccessible to the public. Although there are many variations of this practice, the commonality among them is that they make the person’s criminal records less visible, and they thereby mitigate the informal costs associated with being an ex-convict. This article demonstrates that allowing expungements at a cost can counter-intuitively reduce crime.

Expungements and similar practices1 are becoming more popular, and their functions are being debated among academics,2 perhaps because they are seen as a potential remedy to problems associated with high incarceration rates in the United States. Legal reforms and attempts at reforms parallel these debates. In 2011, two bills were proposed to enable federal expungement authority, although

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1 See Schlosberg et al. (2014) for list and brief review of “mechanism[s] through which an individual may expunge or limit disclosure of a criminal record” (Schlosberg et al. (2014 p. 355)).

they did not pass.\textsuperscript{3} In Delaware, Governor Jack Markell has signed around 1600 pardons in his six years of service to reduce the stigmatization of many ex-offenders.\textsuperscript{4} Most recently, and within the last year, a federal judge in the Eastern District of New York expunged a person’s criminal record claiming that his court has ancillary jurisdiction to expunge records,\textsuperscript{5} whereas the New Jersey Supreme Court made it harder to obtain expungements by limiting their availability to cases where the offense occurred during a "single, uninterrupted" event.\textsuperscript{6} Given these recent developments, it is likely that there will be new legislation and rulings related to expungements in the near future, and it is therefore important to explore the various costs and benefits of expungements.

The existing debates among legal scholars do not directly address whether expungements are likely to increase or reduce crime. Proponents of expanding the availability of expungements often claim that a criminal record presents a barrier to re-entering society, which is a significant cost that can be mitigated (or eliminated) through the use of expungements.\textsuperscript{7} On the other hand, some academics note that allowing expungements violate ‘the people’s right to know’.\textsuperscript{8} Moreover, expungements reduce the expected costs associated with committing crime, and may increase first-time-offenders’ incentives to commit crime.\textsuperscript{9} Thus, the relevant trade-off identified so far appears to be between reducing costs imposed on convicts (and their dependants) on the one hand, and costs associated with greater criminal incentives for first-time-offenders and depriving society of information regarding offenders on the other hand.

In this article, I highlight a feature of expungements that is ignored by many legal scholars, and has yet not been formalized in the economics literature. Ex-convicts who truly wish to refrain from committing crime in the future value expungements more than career criminals, because the latter type is more likely to be re-stigmatized as a result of his future misconduct. In more technical terms, a person’s reservation price for expungements is decreasing in his criminal propensity. Thus, if the government could price expungements, it could separate generally-law-abiding-citizens, who under exceptional circumstances have failed to act in accordance with the law, from career criminals. Moreover, the possibility of purchasing expungements at a price close to one’s reservation price has no effect on a person’s ex-ante incentives to commit crime, because it leaves the expected costs associated with criminal actions almost unchanged. However, an ex-convict who has expunged his record is less likely to commit crime.


\textsuperscript{4}See Barrish and Starkey (2015).


\textsuperscript{6}In re J.S., 121 A.3d 322 (N.J. 2015).

\textsuperscript{7}See, e.g., Roberts (2015).

\textsuperscript{8}See, e.g., Kilcornins and O’Donnel (2003) and Dunn (1987).

\textsuperscript{9}That expungements may reduce the general deterrence by reducing the negative consequences associated with being an offender seems to be stated rather infrequently (see, e.g., Czajkoski (1982) and Easton (1981)), although this is presumably the first effect that comes to mind in the economics of law enforcement context.
crime in the future compared to a similar person with an unexpunged record, because he faces greater expected informal sanctions from recidivating. Thus, expungements can be used to reduce crime by lowering recidivism rates without affecting first-time-offenders’ incentives.

Explaining the dynamics associated with pricing expungements in further detail requires a brief digression into the stigmatizing effect of criminal punishment, and how expungements reduce stigmatization costs. Many previous law and economics studies, both theoretical and empirical, focus on the extra-legal negative consequences associated with having a criminal record. A person (or a corporation) who is convicted of a crime is not only sanctioned through criminal law, but may also receive lower wages in the labor market (e.g. Rasmusen (1996), Lott (1992a), Lott (1992b), Harel and Kelement (2007), Mungan (2015a)). Moreover, a person with a record may suffer negative social consequences due to other people’s reluctance to interact with him (Rasmusen (1996) and Harel and Kelement (2007)). Expungements reduce these costs by making a person’s criminal record unavailable to the public, and therefore harder for people to discriminate against a person based on his criminal record. Sealing one’s criminal record is not very valuable, however, if the person re-offends subsequent to expunging his record, thereby suffering again the costs associated with having a criminal record.

A static model, which ignores the expected future behavior of ex-convicts, is incapable of capturing the full value of expungements to an ex-convict, because it excludes the possibility of the ex-convict re-obtaining a record. Standard multi-period law enforcement models used to study recidivism allow the incorporation of future considerations of this type. In these models, various policies generate two interrelated incentive effects which are conveniently called specific deterrence effects and general deterrence effects (Funk (2004)). Specific deterrence is a function of the crime rate among ex-offenders; whereas, general deterrence relates to the crime rate among people who encounter their first criminal opportunities.

If expungements were free (or automatic) for first time offenders, one would expect them to reduce general deterrence, since they reduce the expected costs associated with committing crime. On the other hand, they are likely to increase specific deterrence, because a person who has an expunged record has more to lose by committing crime (in the form of informal sanctions) than a person who has a visible criminal record. Thus, allowing free expungements is likely to generate a trade-off between specific and general deterrence. However, this trade-off vanishes if one can charge a person a price for expungements that equals his reservation price. There is no general deterrence effect, because the person is indifferent between not expunging his record and suffering informal

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10 Funk (2004) makes a similar observation regarding the specific deterrence reducing effect of stigma, and states that the single period models in Rasmusen (1996) are unable to generate this effect.

11 See, however, Litwok (2014), finding no general deterrence effects.

12 Schlosberg et al. (2014) and Litwok (2014) find specific deterrence effects that are consistent with this conjecture.
sanctions, and expunging his record at a cost that equals the expected informal sanction associated with having a criminal record. But, the specific deterrence effect is still present, because a person with an expunged record still has more to lose than a person with a visible record, and thus is less likely to commit crime.

Not every person’s reservation price for an expungement is the same. Thus, unless the government can price discriminate, it is impossible to charge everyone his reservation price. Fortunately, people with low criminal tendencies (type L) have a higher reservation price for expungements than people with high criminal tendencies (type H), because they are less likely to commit crime in the future and thereby lose some of the value of the expungement. Therefore, setting a price at which only type L people purchase expungements has no effect on the incentives of type H people: Since they do not purchase expungements, they act as if expungements do not exist. Moreover, as explained above, setting the expungement price close to a person’s reservation price for the expungement has almost no effect on his ex-ante incentives. Thus, by pricing expungements close to the reservation price of type L people, one can generate specific deterrence at very small general deterrence costs. Hence, when appropriately priced, expungements reduce crime. Moreover, this finding is fairly robust. As I demonstrate in the proceeding parts, it extends to the case where there are more than two criminal tendencies that a person may possess—including the case where there is a continuum of types. Additionally, because a range of expungement prices lead to a reduction in crime, there is room for error in setting the expungement price, and therefore extreme accuracy in setting the expungement price at the crime minimizing price is not necessary.

Although the primary focus of this article is demonstrating that one may reduce crime by pricing expungements, this practice has additional desirable effects. Among these is providing superior information to the public, which should mitigate, if not eliminate, concerns related to the public’s desire to view criminal records. This is because a conviction provides a noisy signal regarding a person’s type: Type L people commit crimes (even if less frequently) just like type H people in equilibrium, and, therefore, a criminal conviction, absent expungements, cannot be used to perfectly separate high types from low types. Thus, criminal records provide superior information to the public when expungements are priced properly, because they remove low criminal tendency people from the pool of people with ‘unexpunged records’.

As the previous discussion reveals, the model and reasoning presented in this article relies on people having different degrees of criminal ‘tendencies’ rather than different criminal benefits, as is assumed in many law enforcement models. Therefore, in section 2, I present a Beckerian law enforcement model where – unlike in standard models in which people have constant benefits from crime–I consider individuals whose criminal benefits are random variables drawn at the beginning of each period in which the person may commit a crime. This provides a convenient framework to incorporate criminal tendencies through the cumulative distribution functions (CDF) from which criminal benefits are drawn. In particular, if type type H people draw their benefits from a CDF
which *first order stochastic dominates* the CDF that type $L$ people draw their benefits from, then it naturally follows that type $H$ people have greater criminal tendencies than type $L$ people. In addition to this modification, the model also contains a period in which ex-convicts may expunge their past records by paying a price elected by the government. With the exceptions of these two modifications, the model presented in section 2 is a simple law enforcement model with multiple periods, which is often used to study optimal punishment schemes for repeat offenders.\footnote{See, e.g., Miceli (2013) and Mungan (2010) for a recent and brief review of the existing literature on the economic analysis of repeat offender laws.} I analyze this model and summarize my findings via three propositions in section 3.

In section 4, I consider various extensions and topics that can be considered in future work. In particular, I discuss potential benefits that may be obtained through the use of expungements in addition to the crime reduction benefits considered in the modelling sections. Specifically, if separation is valuable for purposes of allocating resources across type $L$ and type $H$ people, there may be gains from criminal records supplying superior information regarding ex-convicts. In section 5, I present some concluding remarks.

2. Model

I consider a three period model where risk-neutral individuals receive benefits from committing a harmful act. Each individual may commit this act twice, once in the first period, and once in the third period. Individuals make criminal decisions separately at the beginning of each of these periods (unlike the alternative simplifying case considered in the literature, e.g., Emons (2007), where the person binds himself to a particular path of action). The law enforcement system catches offenders with a probability of $p$ in each of these periods. If a person commits the offense in the first period, and is subsequently caught, he has an option to expunge his record in the second period at a cost of $X$ chosen by the government. I refer to this cost as the *price* of expungements in the proceeding parts. People also receive external benefits at the end of periods 1 and 3. The magnitudes of these benefits depend on the person’s offense history. These benefits are $\eta$ for people who have no (or an expunged) record, and $\lambda$ for people who have a record. Thus $\sigma \equiv \eta - \lambda > 0$ is the informal sanction, or stigma, attached to having a record. The sanctions for committing crime similarly depend on a person’s history, and is $s_1$ for people never convicted before, and $s_2$ for people who have been previously convicted.\footnote{The assumption that the sanction is $s_2$ for people who have expunged their records is imposed to guarantee that differences in formal sanctions provide no incentives to expunge. The analysis can easily be replicated when the sanction for repeat offenders with expunged records is $s_1$ or any other sanction.}

Individuals’ criminal benefits in periods one and three are random variables, denoted as $b_1$ and $b_3$ respectively, which are drawn in the beginning of each period. The heterogeneity in people’s criminal tendencies is captured by types, $t \in T \subset (0,1)$, which determine the distribution function from which people draw their criminal benefits. In particular, $F^t$ denotes a type $t$ individual’s cumulative distribution function, such that $\nu_t$ first order stochastic dominates
$F^l$ for all $l, h \in T$ with $l < h$, i.e. $F^l(b) > F^h(b)$ for all $b \geq 0$. This essentially implies that it is harder to deter type $h$ people relative to type $l$ people, which means that type $h$ people have greater criminal tendencies than type $l$ people. To make this assumption easily tractable, I assume that $F^t(b) = t \int_{0}^{b} f(b) \text{db} + (1 - t)$, where $(1 - t)$ is the probability with which a type $t$ individual’s criminal benefit draw equals 0. An intuitively appealing feature of this functional form is that it generates a probability (of $1 - t$) with which individuals refrain from committing crime, regardless of the expected punishment associated with crime. Thus, by setting a very low $t$ for type $L$ individuals, one can formalize the idea that these individuals very rarely even consider committing crime.

To preserve the focus of the article, I assume that all policy variables except $X$, i.e. $s_1, s_2$, and $p$, are exogenously given, mainly because the results presented hold for any given set of policy variables. Nevertheless, in section 4.1.a., I discuss the effects of endogenously determining these variables.

3. Analysis:
This section proceeds by backward induction to derive individual’s decision making processes and to formalize the effects of $X$ on general deterrence, specific deterrence, and total crime rates.

3.1. Period 3 Decisions
In the third period, a person (of any type) may belong to one of three categories of individuals. These categories are denoted as $R, E$ and $N$. People in category $R$ are repeat offenders, i.e. people who have committed crime and were caught doing so in period one and who have not expunged their records in period two. Category $E$ contains people who have expunged their records in the second period, subsequent to being caught while committing crime in the first period. Finally, people in category $N$ are people who have no criminal records, either because they have not committed crime, or because they were not caught after committing crime.

Next, let a person’s expected pay-off from committing crime in the third period as a function of his category be denoted as $\psi^C_3$ for $C \in \{R, E, N\}$, and, similarly, let his pay-off from not committing crime be denoted as $\nu^C_3$. Thus, a person in category $C$ commits crime in the third period if $\psi^C_3 > \nu^C_3$. Using this observation, a person’s third period pay-off, $\pi^C_3(b_3)$, as a function of his third period criminal benefit draw and his category, $C$, can be described as:

$$\pi^C_3(b_3) = \begin{cases} 
\psi^R_3 = b_3 + p(\lambda - s_2) + (1 - p)\lambda & \text{if } b_3 > ps_2 \\
\nu^R_3 = \lambda & \text{if } b_3 \leq ps_2 \\
\psi^N_3 = b_3 + p(\lambda - s_1) + (1 - p)\eta & \text{if } b_3 > p(s_1 + \sigma) \\
\nu^N_3 = \eta & \text{if } b_3 \leq p(s_1 + \sigma) \\
\psi^E_3 = b_3 + p(\lambda - s_2) + (1 - p)\eta & \text{if } b_3 > p(s_2 + \sigma) \\
\nu^E_3 = \eta & \text{if } b_3 \leq p(s_2 + \sigma) 
\end{cases}$$

(1)

In the expressions for $\psi^C_3$ above, the second term denotes the probability of getting caught ($p$) times the external benefit ($\lambda$ or $\eta$) minus the formal sanction

\footnote{15I am assuming that people who are indifferent do not commit crime.}
for committing crime \((s_1\) or \(s_2\)), and the third term denotes the probability of evading detection \((1-p)\) times the external third period benefit \((\lambda \) or \(\eta\)). On the other hand, if a person does not commit crime, he simply receives his external third period benefit \((\lambda \) or \(\eta\)).

As (1), above, demonstrates, a person in category \(C\) commits crime if his criminal benefit draw exceeds the expected total third period sanction (i.e. the expected formal sanction plus the expected reduction in external benefits). More specifically, let \(\tau^R_3 \equiv p s_2, \tau^N_3 \equiv p(s_1 + \sigma)\) and \(\tau^E_3 \equiv p(s_2 + \sigma)\). Then, a person in category \(C\) commits crime in the third period if \(b_3 > \tau^C_3\), and, therefore, a type \(t\) person’s likelihood of committing crime in the third period is given by:

\[
1 - F^t(\tau^C_3) = q^C(t)
\]

(2)

In the proceeding parts, I frequently express probabilities and pay-offs without reference to their arguments (e.g. I express \(q^C(t)\) as \(q^C\) and \(\psi^R_3(b_3)\) as \(\psi^R_3\)) to abbreviate notation.

### 3.2. Period 2 Decisions:

The second period is relevant only for individuals who have committed a crime in the first period and were subsequently caught and punished. These individuals face two choices. They may expunge their records at a cost of \(X\) and enter the third period in category \(E\). Alternatively, they may elect to not expunge their records and enter the third period in category \(R\).

The expected second (plus third) period pay-off associated with the first option is given by:

\[
\pi^E_2(X, t) = -X + (1 - q^E)\eta + \int_{\tau^E_3}^{\infty} \psi^E_3 tf(b)db
\]

(3)

This is because the person will not commit crime in the third period with a probability of \((1 - q^E)\) (per (2) above), in which case he will receive a third-period pay-off of \(\psi^E_3\). On the other hand, if he draws a third period criminal benefit of \(b_3 > \tau^E_3\) (which happens with probability \(q^E\)), his third period pay-off, namely \(\psi^E_3\), will depend on his particular draw. Thus, \(\int_{\tau^E_3}^{\infty} \psi^E_3 tf(b)db\) represents his expected third period pay-off from committing crime.

If, on the other hand, he does not expunge his record, his second (plus third) period expected pay-off is:

\[
\pi^D_2(t) = (1 - q^R)\lambda + \int_{\tau^R_3}^{\infty} \psi^R_3 tf(b)db
\]

(4)

Therefore, a person commits crime if \(\pi^E_2 \geq \pi^D_2\), which simplifies to:

\[
X^t \equiv (1 - pq^E)\sigma - \int_{\tau^E_3}^{\tau^R_3} [b_3 - ps_2] tf(b)db \geq X
\]

(5)
$X^t$, defined above, specifies the demand for expungements as a function of one’s type. Proposition 1, below, specifies the relationship between people’s criminal tendencies and their demand for expungements.

**Proposition 1:** (i) The demand for expungements is decreasing in criminal tendencies (i.e. $\frac{\partial X^t}{\partial t} < 0$). (ii) All types have positive reservation prices for expungements, i.e. $X^t > 0$ for all $t$. (iii) Thus, by pricing expungements at $X^s$, one can induce only those types with $t \leq s$ to purchase expungements, i.e. one can separate types with $t \leq s$ from types with greater criminal tendencies for any $s$.

**Proof:** (i) Differentiating $X^t$ wrt $t$, as expressed in (5), reveals that $\frac{\partial X^t}{\partial t} = -p\sigma \frac{\partial q^E}{\partial \tau^E} \int_{\tau^E}^{\tau^R} [b_3 - ps_2] f(b) db$. (2) reveals that $\frac{\partial q^E}{\partial \tau^E} = 1 - \int_0^{\tau^E} f(b) db$, and, therefore

$$\frac{\partial X^t}{\partial t} = -p\sigma (1 - \int_0^{\tau^E} f(b) db) - \int_{\tau^E}^{\tau^R} [b_3 - ps_2] f(b) db < 0.$$ (ii)

$$X^t = (1 - pq^E)\sigma - \int_{\tau^E}^{\tau^R} [b_3 - ps_2] tf(b) db$$

$$> (1 - pq^E)\sigma - \int_{\tau^E}^{\tau^R} [\tau^E - ps_2] tf(b) db$$

$$= \sigma (1 + q^E (1 - p) - q^R) > 0$$

(iii) Follows directly from parts (i) and (ii).

It is worth highlighting the intuition behind the two components of $X^t$ specified in (5). The first term (i.e. $\left(1 - pq^E\right)\sigma$) describes the gain, in the form of reduced expected stigma, associated with expunging one’s record. Intuitively, this gain ought to be lower for people with high criminal tendencies, because they expect to re-stigmatize themselves by re-offending in the third period more frequently than people with low criminal tendencies. This is, in fact, the case since (as (2) reveals) $q^E$ is increasing in $t$, and thus $\left(1 - pq^E\right)\sigma$ is smaller for people with high criminal tendencies.

The second term describes the commitment loss associated with expunging one’s record. In particular, by expunging his record, a person binds himself to not committing crime when he draws a third period benefit below $\tau^E = p(s_2 + \sigma)$. On the other hand, if a person had not expunged his record, he would commit a crime in the third period in a wider range of circumstances, i.e. when his draw exceeds $ps_2 < p(s_2 + \sigma)$. Thus, expunging one’s record implies a commitment to refrain from criminal acts, which is, intuitively, a greater sacrifice for people with high criminal tendencies, since they are more likely to find themselves in situations where they could, but for external costs, profitably commit crimes.
Proposition 1, above, exploits these observations and points out that the decreasing demand for expungements can be used to separate high criminal tendency people from low criminal tendency people, and that this can be done for any targeted type, i.e. one can achieve separation for any definition of "high" versus "low" criminal tendency. Section 4.2., below, discusses the potential normative desirability of achieving such separation.

3.3. Period 1 decisions:

In the first period, all individuals decide between committing and refraining from committing crime and consider their second and third period best responses (described in (1) and (5) above) while doing so. Not committing crime implies a pay-off of \( \eta \) in the first period, and that a person enters the third period in category \( N \) (and skips the expungement period, since he has no record). Thus, the pay-off from not committing crime is:

\[
\nu_1^t = \eta + E(\pi_3^t) = (2 - q^N)\eta + \int_{\tau_3^N} \psi_3^N tf(b)db
\]

where \( E(\pi_3^t) \) denotes expected the third period pay-off. On the other hand, if a person commits crime, with a probability of \( (1 - p) \) he is not caught, and therefore he obtains the same pay-off as a person who refrains from committing crime (i.e. \( \nu_1 \)) in addition to the benefit of \( b_1 \) from committing crime. With the residual probability of \( p \), his first period pay-off is \( b_1 + \lambda - s_1 \), and his combined second and third period pay-off is the greater of \( \pi_2^E \) and \( \pi_2^D \), since he expunges his record if \( \pi_2^E \geq \pi_2^D \). Thus, his total expected pay-off from committing crime is:

\[
\psi_1^t = b_1 + p(\lambda - s_1 + \max\{\pi_2^E, \pi_2^D\}) + (1 - p)\nu_1^t
\]

Hence, a person commits crime if \( \psi_1^t > \nu_1^t \), which is equivalent to:

\[
C(b_1, X, t) = b_1 + p[\lambda - s_1 - \nu_1^t + \max\{\pi_2^E(X, t), \pi_2^D(t)\}] > 0
\]

This expression leads to the following observation, which plays an important role in the derivation of additional results.

**Observation 1:**

(i) For all \( t \in T \) and all \( X \geq 0 \), there exists \( b_1^t(X) \), such that

\[
C(b_1, X, t) \geq 0 \text{ if and only if } b_1 \geq b_1^t(X)
\]

(ii) Moreover, \( b_1^t(X) > 0 \) for all \( X \) and \( t \) if \( s_2 \geq s_1 \).

The first part of the observation follows easily from the facts that \( \partial C/\partial b_1 > 0 \), \( \lim_{b_1 \to -\infty} C = \infty \), and \( \lim_{b_1 \to -\infty} C = -\infty \). Part (ii) of Observation 1 simply states that, unless first time offenders are punished more severely than repeat offenders, people who draw sufficiently low criminal benefits in the first period elect to refrain from committing crime. This is a rather intuitive result, and the contrary case, where some people commit crimes even when their draw is \( b_1 = 0 \), is possible only if by committing crime a person increases his expected future
pay-off, i.e. unless there is an investment value to committing crime. This is because, his present pay-off from committing crime is unambiguously negative (since $b_1 = 0$, and the expected formal plus informal first period sanction is $p(s_1 + \sigma) > 0$). The only instance where committing crime has a sufficient investment value is when $s_1 \gg s_2$, i.e. committing crime greatly reduces the future punishment for committing crimes, and thereby increases future expected gains by more than present expected losses from committing crime. Because repeat offenders are almost always punished more severely than first-time offenders, I assume that this condition does not hold. Moreover, as will be evident from the proceeding analysis, the contrary assumption implies that expungements have an even smaller effect on general deterrence, and therefore may only broaden the conditions in which expungements can be used to reduce crime.

Sections 3.1.-3.3. fully describe individuals’ best responses to the government’s policies. The next section links individuals’ best responses to crime rates and discusses the general and specific deterrence consequences of expungement policies.

3.4. General and Specific Deterrence, and Crime Minimizing Expungement Prices

To calculate crime rates, let $\theta^t_1 = 1 - F^t(b^t_1)$ denote the first period crime rate among type $t$ individuals (where $b^t_1 = b^t_1(X)$ is defined in (9)). To calculate the third period crime rate among each type, note that $(1 - p)\theta^t_1$ proportion of type $t$ people enter the third period in category $N$ despite committing crime in the first period, and that $(1 - \theta^t_1)$ proportion of type $t$ people enter the third period in category $N$ because they have not committed crimes in the first period. Thus, the probability of committing crime is $q^S$ for $(1 - p\theta^t_1)$ proportion of type $t$ people. Moreover, $p\theta^t_1$ proportion of type $t$ people enter the second period with a record, and they expunge their records if $X > X^t$. Letting

$$q^S(X, t) = \begin{cases} q^E & \text{if } X \leq X^t \\ q^N & \text{if } X > X^t \end{cases}$$

(10)

the proportion of type $t$ ex-convicts committing crime in the third period can be expressed as $pq^S\theta^t_1$. Thus, the third period crime rate among type $t$ people is $\theta^t_3 = (q^N(1 - p\theta^t_1) + pq^S\theta^t_1) = \theta^t_1(pq^S - pq^N) + q^N$, and therefore the total crime rate among type $t$ people is

$$\theta^t = \theta^t_1 + \theta^t_3 = \theta^t_1(1 + p(q^S - q^N)) + q^N$$

(11)

This expression combined with (8) reveals a very simple, yet interesting, result that relates to the concepts of general and specific deterrence. Specific deterrence is associated with the incentives of ex-convicts: a policy that reduces the proportion of ex-convicts committing crime is said to have a specific deterrence effect. This corresponds to a reduction in $q^S$ in the current model. General deterrence, on the other hand, refers to the first period incentives of individuals to commit crime. Thus, a reduction in general deterrence corresponds to an increase in $\theta^t$ in the current model.
Proposition 2, below, formalizes results that pertain to general and specific deterrence, and it, and other derivations, use the following notation:

\[ t \equiv \min T \]  \hspace{1cm} (12)

**Proposition 2:** (i) Setting the price of expungements at \( X_L \), relative to not allowing expungements, generates specific deterrence of type \( t \) people without reducing the specific deterrence of other types or the general deterrence of any type. (ii) Thus, if there is a positive measure of type \( t \) individuals, pricing expungements at \( X_L \) reduces crime relative to not allowing expungements.

**Proof:** (i) Let \( X^p > X_L \) be a prohibitively expensive expungement price, i.e. one where no type purchases expungements, such that offering expungements at \( X^p \) is functionally equivalent to not allowing expungements. (8) implies that \( C(b_1, X^p, t) = C(b_1, X_L, t) \), since, per (3), (4), and (5), \( \max \{ \pi^p_1(X, t), \pi_2^p(t) \} = \pi^p_2(t) \) for all \( X \geq X_L \). Thus, \( b_1^p(X_L) = b_1^p(X^p) \) for all \( t \in T \), and, therefore, \( \theta^1(t) = 1 - F^1(b_1^p(X_L)) = 1 - F^1(b_1^p(X^p)) = \theta^1_t(X^p) \) for all \( t \in T \). Thus, allowing expungements at a price of \( X_L \) has no general deterrence effect relative to not allowing expungements. But, \( q^S(X^p, t) = q^E(t) = 1 - F^1(p(s_2 + \sigma)) < 1 - F^1(p(s_2)) = q^S(X_L, t) \). Hence, allowing expungements at a price of \( X_L \) increases the specific deterrence of type \( t \) people relative to not allowing expungements. Finally, reducing \( X \) from \( X^p \) to \( X_L \) does not affect \( q^S(X, t) \) for any \( t \in T \setminus \{ t \} \), since \( \pi^p_2(X, t) < \pi^p_2(t) \) for all \( X \geq X_L \) and all \( t \in T \setminus \{ t \} \).

(ii) The crime rate among type \( t \) people is given by \( \Theta^1(X) = \theta^1_t(X)(1 + p(q^S(X, t) - q^N(t)) + q^N(t) \). Thus, expungements can affect crime rates only through their effect on \( \theta^1_t \) and \( q^S \). As shown in part (i), reducing \( X \) from \( X^p \) to \( X_L \) has no effect on \( \theta^1 \) for any \( t \in T \), neither does it affect \( q^S(X, t) \) for any \( t \in T \setminus \{ t \} \). But, the same price change reduces \( q^S(X, t) \) from \( q^R(t) \) to \( q^E(t) \), thus \( \theta^1(X_L) < \theta^1(X^p) \). Hence, if type \( t \) people have a positive measure, reducing \( X \) from \( X^p \) to \( X_L \) reduces crime through its specific deterrence effect on type \( t \) people.

Proposition 2 demonstrates how the negative relationship between people’s demand for expungements and their criminal tendencies can be used to produce specific deterrence of people with low criminal tendencies, and perhaps more importantly, without the need for sacrificing deterrence elsewhere. However, as the proposition notes, this is possible only if type \( t \) people have a positive measure. Moreover, this proposition also implicitly relies on people expunging their records in the second period when they are indifferent between doing so and not expunging their records. The latter assumption becomes important when there is a continuum of types, in which case, it is also natural to assume that no type has positive measure. Finally, although I do not formally consider errors here, the implementation of this proposition would require setting a very precise price for expungements: any price above \( X_L \) results in no one buying expungements, whereas a price below \( X_L \) results in a reduction of general deterrence for type \( t \) people.

Assuming that \( T \) consists of a continuum of types directly and indirectly addresses these points. In particular, (i) it guarantees that results obtained do
not rely on a particular type of individual having a positive measure; (ii) the indifference assumption has no effect, and (iii) small deviations from a targeted expungement price (smaller than $X^t$) do not produce large effects on crime rates, and thus, one can instead specify a price range for expungements such that any price in that range induces a reduction in crime rates. Thus, the remaining analysis focuses on the case where $T = [t, \tilde{t}]$. To formalize results in this case, let $g(t)$ denote the density function for types such that $g(t) > 0$ for all $t \in T$. Using this notation in conjunction with (11), the total crime rate is given by

$$\Theta(X) = \int_{t}^{\tilde{t}} \theta'(X)g(t)dt$$

(13)

The next proposition shows that by pricing expungements appropriately one can reduce $\Theta$ below what it would be absent expungements. Moreover, because there is a range of prices that guarantees this result, small deviations from the expungement price that minimizes $\Theta$ still result in a crime level below that which would be observed without expungements.

**Proposition 3**: (i) Crime can be reduced by allowing expungements. In particular, there exists a range of prices, such that offering expungements at any of these prices results in less crime than not allowing expungements, i.e. there exists $X^t$ such that $\Theta(X) < \Theta(X^P)$ for all $X \in [X^t, X^\mathbb{L})$ and $X^P \geq X^t$. (ii) The crime minimizing expungement price results in more [less] specific [general] deterrence than a regime where expungements are not available.

**Proof**: (i) Plugging in (11) into (13) and noting, per (10), that $q^S(X,t) = \begin{cases} q^E & \text{if } X \leq X^t \\ q^N & \text{if } X > X^t \end{cases}$, reveals that $\Theta$ can be expressed as:

$$\Theta(X) = \begin{cases} \int_{t}^{\tilde{t}}(\theta^E_1(1 + p(q^E - q^N)) + q^N)g(t)dt & \text{if } X < X^\mathbb{L} \\ \int_{t}^{\tilde{t}}(\theta^E_1(1 + p(q^E - q^N)) + q^N)g(t)dt + \int_{t^*}^{\tilde{t}}(\theta^R_1(1 + p(q^R - q^N)) + q^N)g(t)dt & \text{if } X \in (X^\mathbb{L}, X^\mathbb{T}] \\ \int_{t}^{\tilde{t}}(\theta^R_1(1 + p(q^R - q^N)) + q^N)g(t)dt & \text{if } X \geq X^\mathbb{T} \end{cases}$$

(P.2.)

where $t^*(X)$, the type who is indifferent between expunging his record and not expunging his record at price $X$, is defined by manipulating (5) as

$$t^*(X) = \frac{(1 - pq^E)\sigma - X}{\int_{ps_2}^{(b_3 - ps_2)}f(b)db}$$

(P.3.)

(P.2.) implies that

$$\Theta^N \equiv \Theta(X) = \int_{t}^{\tilde{t}}(\theta^R_1(1 + p(q^R - q^N)) + q^N)g(t)dt, \text{ for all } X \geq X^\mathbb{T}$$

(P.4.)
where $\Theta^N$ is a constant, since $\frac{d\theta}{dX} = -f(b^1)\frac{d\beta(X)}{dX} = 0$ for all $X \geq X_d$.

On the other hand, for all $X \in (X_d, X^*_t)$,

$$\frac{d\Theta(X)}{dX} = p\theta_1^*(q^R(t^*) - q^E(t^*))g(t^*) - p f(b_1^*) \int t^* \frac{d}{dt} \left( 1 + p(q^E(t) - q^N(t))g(t) \right) dt$$  \hspace{1cm} \text{(P.5.)}$$

since $\frac{d\theta}{dX} = -1$ as implied by (P.3.), and $\frac{d\theta}{dX} = f(b) \frac{d\Gamma}{dX} = -f(b_1^*) p$, as implied by (8), (9) and the fact that $\theta_1^* = 1 - F(b_1^*)$. Thus, $\frac{d\theta}{dX} > 0$, if

$$A(t^*(X)) \equiv \theta_1^* (q^R(t^*) - q^E(t^*))g(t^*) - f(b_1^*) \int t^* \frac{d}{dt} \left( 1 + p(q^E(t) - q^N(t))g(t) \right) dt > 0$$  \hspace{1cm} \text{(P.6.)}$$

It follows that $A(t^*(X_d)) = A(t) = \theta_1^* (q^R(t) - q^E(t))g(t) > 0$, and therefore, there exists $\varepsilon$ such that $A(t^*(X)) > 0$ for all $X$ such that $X^* \equiv X_d - \varepsilon \leq X$. Thus, $\Theta(X) < \Theta^N$ (as defined in (P.4.)) for all $X \in [X_d, X^*_t]$.

(ii) The crime minimizing expungement price $X^*$ is in the interval $[X_d^*, X^*_t]$, because, as is evident from (P.2.), $\frac{d\theta}{dX} < 0$ for all $X < X_d$. Thus, when expungements cost $X^*$, all ex-convicts of types $t \in [t, t^*(X^*)]$ are specifically deterred, since $q^E(t) = q^E(t^*) < q^R(t)$ for all $t \in [t, t^*(X^*)]$. Similarly, $\theta_1^*(X^*) > \theta_1^*(X^P)$ for all $X^P > X_d$, which means that there is a loss in general deterrence.

Proposition 3 concludes the formal analysis of the model introduced in section 2. Next, I consider some normative implications of Proposition 1-3.

4. Normative Implications

4.1. Optimal Deterrence

The analysis in section 3 is purely positive, i.e. it is concerned only with the incentives and behavior of individuals. However, because it is typically desirable to reduce crime, the normative implication is generally straightforward: Expungements ought to be used to minimize crime. In fact, this conclusion always follows if one does not include criminals' benefits in the social welfare calculus, as suggested by Stigler (1970), since then the objective becomes the minimization of social harm caused by crime. However, if one includes criminal benefits in the social welfare function, under some circumstances, criminal punishment may result in what is called over-deterrence in the literature, i.e. the deterrence of behavior that generates greater benefits (b) to the actor than the harm (h) it causes to society. If over-deterrence is a possibility, then it is a priori unclear whether reducing crime through the use of expungements is optimal. Next, I outline under what circumstances over-deterrence may become a problem, and explain how using expungements may be socially desirable even in those circumstances.

Although I have assumed that $p, s_1$ and $s_2$ are exogenously given, the existing economic models of law enforcement show that it is generally optimal to choose a low $p$ and increase $s_1$ and $s_2$ as much as possible, because it is typically more
expensive to increase \( p \) than \( s_1 \) and \( s_2 \). (Polinsky and Shavell (2007) extensively surveys this literature). Thus, the previous literature generally assumes that there is a maximum sanction, \( w \), that \( s_1 \) and \( s_2 \) may not exceed. The result is that, absent expungements, sanctions are set at the maximal level, and the optimal \( p \) is determined by the trade-off between enforcement costs and gains from reducing crime. Hence, as established in Becker (1968), under-deterrence, i.e. setting sanction schemes such that people with \( b < h \) commit crime, becomes optimal.

The impact of adding expungements to this model is straightforward; one reduces the cost of under-deterrence by allowing expungements at the crime minimizing price (and thereby reducing total crime) as explained in the previous parts of this article. A secondary effect is that the optimal investment in enforcement costs (i.e. investments to increase \( p \)), under plausible assumptions, is reduced through the availability of expungements, because expungements reduce under-deterrence, and therefore the benefit from increasing \( p \). The primary result presented in the article, namely that expungements can be used to reduce crime, is unaffected by these considerations.

This analysis is not necessarily valid when punishment generates asymmetric costs for individuals.\(^{16}\) In the present context, punishment may generate different informal sanctions for different people. For instance, if wage reductions that result from criminal convictions depend on the person’s salary and/or profession, people at higher paying jobs may suffer greater informal sanctions. In limited circumstances –identified in Mungan (2015b)– these asymmetries may cause over-deterrence problems for people who suffer extra-ordinarily large informal sanctions from convictions. Even in these limited cases, expungements can be offered at prices which are only acceptable for people who would be over-deterred when expungements are not available (since these people have greater reservation prices for expungements). This argument is formalized in the static context in Mungan (2015b) and can be combined with the multiple period analysis proposed in the current article.\(^{17}\)

4.2. Allocative Gains

One of the advantageous features of pricing expungements (formalized in

\(^{16}\) See, e.g., Shavell (1990) and Mungan (2011) where the punishment for attempts and regulation violations, respectively, have different effects on people with different likelihoods of causing harm through their violations.

\(^{17}\) In fact, by plugging in (4) and (6) into (8) one can calculate the threshold first period criminal benefit draw that induces a person to commit crime in the first period as:

\[
b_1^* = (1 - q^N)(s_1 + \sigma) + \sigma + q^R s_2 - \int_{b_3^*}^{b_2^*} b_3 f(b)db
\]

For people with \( \sigma > s_2 - s_1 \), this expression is greater than \( b_2^* \), implying that the first period level of over-deterrence without expungements is greater than the second period level of over-deterrence for people with expunged records. Moreover, since \( p < 1 \), the number of instances in which over-deterrence becomes a problem for people with expunged records is even smaller. Thus, over-deterrence can be mitigated with expungements in the three period model presented in this article as well.
Proposition 1) is that they allow separation between high and low criminal tendency people. There are arguments made in the criminology literature that criminal tendencies are correlated with character traits that are also correlated with a person’s productivity at the workplace. Thus, if hiring involves specific investments in employees, and if these investments result in positive returns only if the person is productive and/or has certain character traits, the separation induced by pricing expungements can result in greater returns from these investments by providing less noisy information about employees to employers.

5. Conclusion

Underlying the commentary and legal scholarship on expungements and other forms of criminal record sealing practices seems to be the idea that people who have made unusual mistakes or have committed crimes under very rare circumstances deserve a second chance. This article demonstrates that it is exactly this group of individuals who should be willing to make substantial sacrifices to obtain a second chance. Thus, the criminal justice system can separate people based on their criminal tendencies by making expungements costly. This type of pricing not only gives people with low criminal tendencies a second chance, but also reduces crime by generating specific deterrence. These features of making it costly to expunge criminal records should be taken into account in policy debates surrounding new reform proposals regarding expungements.

References


