On the effective use of stigma as a crime-deterrent

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Received 17 May 2002; accepted 4 October 2003

Abstract

Stigma affects convicted offenders if employers reduce their wage. Current research considers this kind of informal sanctioning as an effective means for reducing crime and proposes its fostering by the government. In this article, I first show that increasing stigma may even enhance crime. While stigma enhances deterrence of an unconvicted offender, it may drive a stigmatized ex-convict towards recidivism. Secondly, I provide a solution for guaranteeing stigma’s effectiveness. Notably a harsh(er) punishment for repeat offenders is required. Finally, with the theoretical analysis as a background, stigmatization policies pursued in the States, Switzerland and Spain are compared.

JEL classification: K14; K42

Keywords: Crime; Stigma; Informal punishment

1. Introduction

Economic models of crime elaborate on the role of governmental punishment in achieving deterrence. Yet, theoretical arguments as well as empirical evidence suggest that the formal (governmental) punishment that a convicted criminal is confronted with, constitutes only part of the whole penalty. If the act of committing a crime lowers...
productivity, or if criminal and unproductive characteristics of workers are positively correlated in a world of asymmetric information, a rational employer stigmatizes a convicted criminal by reducing his wage (Rasmusen, 1996). Empirical evidence confirms that wage reductions after conviction are substantial. Depending on the crime committed, these stigmatization costs (in terms of wage reductions) may by far exceed the governmental penalty.\(^2\)

Occurrence of “punishment” in the labor market (hereafter abbreviated by stigmatization or informal punishment) can partly be controlled by the government. By handing out criminal records to the employers or not, the degree of stigmatization is varied. While in the United States, there seems to be a tendency towards facilitating the access to criminal records (“Megan’s-Law”, for instance, encourages stigmatization of sexual offenders\(^3\)), the opposite holds true for Switzerland: Legal changes are planned after which an employer asking for a criminal record will only be informed about serious offenses. Less serious offenses which are punished by no more than 3 years of prison will no longer be listed in the criminal record. Therefore, “mild offenders” cannot be stigmatized anymore (Bundesamt für Justiz, 1995).

In view of these internationally contrasting policies, a complete understanding of how stigma shall be used seems indispensable.

The seminal article on informal sanctioning in the labor market is Rasmusen (1996). In two models (differing with respect to the employer’s motivation to reduce a criminal’s wage) he explains the amount of stigmatization and shows that greater stigma reduces crime.\(^4\) Therefore, Rasmusen concludes that “stigma shares with fines the advantage of deterring the criminal without creating real costs...” (Rasmusen, 1996, p. 536). As such, complete publication of criminal records is called for in order to exploit informal punishment to the largest extent.

In contrast to Rasmusen’s (1996) model, which only considers unconvicted offenders, Furuya (2002) restricts his attention to formerly convicted offenders. Since non-employment of stigmatized ex-convicts is assumed to impose exogenous costs on society (social welfare payments, recidivism), Furuya (2002) derives conditions under which public employment of ex-convicts is socially beneficial.

The goal of this paper is to re-evaluate stigma’s role as a crime-deterrent in a more comprehensive model accounting for unconvicted as well as convicted offenders.

By considering the reactions of convicted as well as unconvicted offenders, stigma’s benefits (Rasmusen’s (1996) deterrence idea) as well as stigma’s costs (Furuya’s (2002) recidivism idea) can be compared. In contrast to Furuya (2002), who assumes exogenous costs of stigmatization, I make the link between stigma and a convicted offender’s incentive to commit a crime explicit. Therefore, in addition to derive the different effects of stigma on crime, I am able to analyze through which measures government can mitigate potential negative side-effects of stronger stigmatization.


\(^3\) This law prescribes residents to be warned about sexual offenders moving into their area. For details, see e.g. Filler (2001).

\(^4\) In the first model, it is assumed that an employer reduces a convicted criminal’s wage because crime lowers productivity (moral hazard model), in the second model, the wage is lowered because of a positive correlation between criminal and unproductive characteristics of the workers (adverse selection model).
My model clearly builds on Rasmusen’s (1996) work, but differs from it in two respects: First, in Rasmusen’s (1996) analysis, neither crime nor legal activities requires employment of any resources. However, as pointed out by Ehrlich (1973), a realistic model would assume legal and illegal activities being time consuming and being used in a substitutive manner. Therefore, the criminal decision is formulated as a time-allocation problem between legal and illegal activities, where stigma hits a convicted criminal in the period after conviction. Second, in contrast to Rasmusen (1996), the effect of stigma on criminal behavior is not only analyzed for an unconvicted, but also for a convicted individual.

The main results are the following:

(i) In the basic model where illegal earning opportunities are prevalent outside the workplace (separate legal and illegal markets), stronger stigma induces opposite effects. Whereas strong stigma deters an unconvicted individual from committing crimes (deterrence effect), it simultaneously enhances recidivism of a convicted and stigmatized offender (recidivism effect). The cause of this undesirable side-effect is the reduction of legal wages for stigmatized criminals, which favors the relative attractiveness of crime.

Therefore, in contrast to Rasmusen’s (1996) research which considers stigma as an effective deterrent without social costs, I show that increasing stigma may even be counter-effective. Conditions, under which stigma proves to be effective (or not), are derived.

(ii) As a second important result, it is demonstrated that stigma’s effectiveness can be ensured by complementing it with adequate formal punishment: Notably, a strong punishment for repeat offenders helps counterbalancing the negative incentive effects of stronger stigmatization (which occur after conviction).

As such, the “recidivism costs” from stigmatization can be reduced by increasing the punishment of repeat offenders—which can be costly depending on the type of formal punishment used.

(iii) Finally, if illegal earning opportunities are present at work (extended model: Overlapping legal and illegal markets), I show that the negative-incentive effects of stronger stigmatization get weaker. Because a criminal record may prevent a criminal from being hired at places with high illegal gains (e.g. a child molester from being employed at a kindergarten), stigma may actually decrease recidivism. Hence, the negative-incentive effects of stigma get smaller, the more illegal earning opportunities are tied to the legal workplace.

As for the degree of stigmatization, it turns out to depend on formal punishment as follows: The higher the formal punishment for repeat offenders, the smaller is

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5 The decision makers in Rasmusen’s models are risk neutral individuals who choose whether to engage in criminal affairs or not. For this, they compare the payoff from legal behavior with the expected payoff from illegal behavior (composed of the expected legal and illegal earnings minus the expected penalty). Legal earnings equal the wage \( w \), if no conviction occurs, however, in the case of conviction, the offender is stigmatized and legal earnings are reduced to \( s \cdot w \) (\( s \in [0, 1] \) represents the stigmatization factor). Clearly, stigma lowers the expected payoff from criminal activities and therefore deters individuals from committing crimes.
the risk of crime at work, and also the amount of wage-reduction. Therefore, informal punishment is used as a strategic substitute to formal punishment.\textsuperscript{6}

Relating my article to the literature on non-legal sanctions in general (see e.g. Kahan and Posner, 1999; Cooter and Porat, 2001),\textsuperscript{5} there is one important distinction. This paper focuses on stigmatization in the labor market and challenges the view that stigma is a cost-effective deterrent by providing arguments which are specific to the labor market.\textsuperscript{8} Even more different from my analysis is the research on reputational penalties of firms. Although Karpoff and Lott (1993) analyze the interaction between fines (governmental) and reputational penalties for firms engaging in criminal fraud, the firms’ incentives to cheat on product quality are so different from the individuals’ incentive to commit a crime that their results are not applicable to my analysis.\textsuperscript{9}

The rest of this article is structured as follows: In Section 2, the basic model is presented together with some results from comparative statics. An extension of the model, which allows for illegal earning opportunities at work, is given in Section 3. Implications for public policy are discussed in Section 4.

2. The basic model

I focus on risk neutral individuals seeking to maximize total earnings. Assume that two independent markets of employment exist: One for legal activities and one for illegal activities. The problem facing a potential criminal is how to allocate a fixed amount of working time $\hat{t} \geq 0$ to these different sources of income. Returns in either market are assumed to be linearly dependent on working time as well as wages.

\textsuperscript{6}Although Rasmusen (1996) as well as Furuya (2002) mention that crimes committed at work may be a reason for reducing an ex-convict’s wage, no link between the extent of wage-reduction and the punishment in case of repeated conviction is made.

\textsuperscript{5}The literature on the use of shaming-penalties (which range “from stigmatizing publicity to coerced gestures of public contribution to ritualized debasement ceremonies”, Kahan and Posner, 1999, p. 365) points out the advantages of shaming as a cost-effective deterrent together with a certain capability of expressing moral condemnation.

\textsuperscript{8}The key difference to the other studies on non-legal sanctions is that stigmatization in the labor market takes the form of a wage-cut, which creates negative-incentive effects on crime.

\textsuperscript{9}One of the main points of Karpoff and Lott (1993) is that the market for criminal fraud, or more specifically, firms cheating on product quality, regulates itself pretty well even without legal intervention. Firms can engage in costly reputation building actions and consumer decide whether they want to pay a higher price for a higher expected quality or whether they prefer lower prices going along with a lower expected quality (e.g. by buying from the flea market). Increasing criminal penalties are claimed to be imperfect substitutes for reputation in this context. While reputation might ensure an optimal level of fraud for firms, the same is very unlikely to occur for criminal offenses committed by individuals. There is generally no repeated interaction between seller and buyer (or offenders and victims) which could provide an effective reputation mechanism. Also, without a criminal record, a wage reduction in the labor market is hardly expected to occur, since it is difficult for an employee to signal his criminal type. Therefore, the starting point of my analysis is a setting where (information about) legal conviction is needed to initiate punishment. In this setting, I then analyze how to employ stigma in an effective way.
(\hat{t} - t), w \geq 0, describes the legal return function and \( G = g \cdot t, g \geq 0, \) the corresponding illegal one. \( t, \) with \( 0 \leq t \leq \hat{t}, \) represents time allocated to illegal activities. If a positive amount of \( t \) is chosen, the offender gets convicted with probability \( p = \theta \cdot t, p \in [0,1], \) and incurs a public penalty of the amount \( F = f \cdot t, f \geq 0. \) Additionally, stigmatization affects him a period later. \( L = s \cdot w \cdot (\hat{t} - t) \) represents the legal earning function of a stigmatized individual. \( s \in [0,1] \) captures the stigma effect and assumes a value of 0 in the case of complete stigmatization and a value of 1 if there is no stigmatization.

The extent of stigmatization \( s \) depends (a) on whether the employer obtains information about past crimes or not and (b) given that he obtains the information, on the perceived productivity discount of a criminal compared to a non-criminal person. For instance, convicted criminals might have experienced a depreciation of human capital during their prison stay, or even during their criminal careers, they might have had less time to invest in (non-criminal) human capital.\(^{11}\) As such, if the employer expects an output \( q \) from an unconvicted person, but only \( \alpha \cdot q (\alpha < 1) \) from a convicted person, he might discount a convicted criminal’s wage by \( s = \alpha. \)\(^{12}\)

Fig. 1 represents the individual’s decision tree. The probabilities of getting in the states conviction/no conviction are indicated on the branches,\(^{13}\) the payoffs in these states at the end of the branches. As for the notations on illegal time \( t, \) numbered subscripts always indicate the period. The time allocations in the second period depend on the conviction state \( S_1 \in (c,n) \) at the end of period one, which can be either conviction \( (c) \) or non-conviction \( (n) \). To save on space, I introduce the following abbreviations: \( t_{2|n} \equiv t_2|S_1 = n, \) \( t_{2|c} \equiv t_2|S_1 = c. \)

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\(^{10}\) The quadratic expected penalty function is chosen because it allows the choice of inner solutions. Therefore, this corresponds to Ehrlich’s (1973) empirical observation after which oI?Tenders often devote time to legal as well as illegal activities. However, the linearity of the penalty and probability of conviction functions in \( t \) is not crucial for the results. The driving force lies solely in the assumption that the probability of conviction depends on the time spent on illegal activities. Other reasonable conviction functions, where the marginal probability of conviction decreases in \( t \) due to acquired criminal skills, together with a constant public penalty \( F, \) are also possible in order to obtain the major effects. However, an inner solution is not optimal in this case.

\(^{11}\) See also Rasmusen’s (1996) explanations for a lower expected productivity of convicted compared to unconvicted individuals.

\(^{12}\) In line with Furuya (2002), I do not explicitly model the employer’s belief about an unconvicted employee’s possible criminal type. It is sufficient to assume that a criminal is perceived as less productive than a non-criminal and that therefore, the wage of a convicted offender is lower (or equal) than that of an unconvicted offender—which holds even if the employer correctly accounts for the fact that an employee with a blank criminal record is an undetected criminal with positive probability. Note also that for a criminal record being informative, some individual heterogeneity in illegal gains as well as the individual amount of working time \( \hat{t} \) must exist. Otherwise, the employer can infer the type from the work contract (chosen amount of legal time), or, if all the parameters are the same for the individuals, everybody spends an equal amount of time to legal and illegal work and conviction does not give any additional information about the criminal propensity.

\(^{13}\) For simplicity, I assume the marginal probability of conviction in the second period to be the same for unconvicted and convicted individuals. Hence, I do not account for the possibility that previously convicted criminals might be supervised and caught with a higher probability.
2.1. Stigma and criminal behavior

Let us calculate how the individual’s optimal illegal time depends on the level of stigma. Applying backwards induction, I first solve for the second-period time allocations.

An individual who was not convicted in the first period maximizes his expected payoff

$$E\pi(t_{2|n}; w, g, f, \theta, \bar{t}) = \theta \cdot t_{2|n} \cdot (w \cdot (\bar{t} - t_{2|n}) + g \cdot t_{2|n} - f \cdot t_{2|n})$$

$$+ (1 - \theta \cdot t_{2|n}) \cdot (w \cdot (\bar{t} - t_{2|n}) + g \cdot t_{2|n})$$

(1)

under the constraint that $0 \leq t_{2|n} \leq \bar{t}$.

Assuming interiority, maximization of (1) yields

$$t_{2|n}^* = \frac{g - w}{2 \cdot \theta \cdot f}.$$  (2)

For an individual convicted in period one, the expected payoff in period two is represented by

$$E\pi(t_{2|c}; w, g, f, \theta, s, \bar{t}) = \theta \cdot t_{2|c} \cdot (s \cdot w \cdot (\bar{t} - t_{2|c}) + g \cdot t_{2|c} - f \cdot t_{2|c})$$

$$+ (1 - \theta \cdot t_{2|c}) \cdot (s \cdot w \cdot (\bar{t} - t_{2|c}) + g \cdot t_{2|c}).$$  (3)

The interior solution to the maximization of (3) is

$$t_{2|c}^* = \frac{g - s \cdot w}{2 \cdot \theta \cdot f}.$$  (4)

The expected payoff of an individual in period one is given by

$$E\pi(t_1; w, g, f, \theta, s, \bar{t}) = \theta \cdot t_1 \cdot (w \cdot (\bar{t} - t_1) + g \cdot t_1 - f \cdot t_1)$$

$$+ (1 - \theta \cdot t_1) \cdot (w \cdot (\bar{t} - t_1) + g \cdot t_1)$$

$$+ \theta \cdot t_1 \cdot E[\pi_{2|c}] + (1 - \theta \cdot t_1) \cdot E[\pi_{2|n}].$$  (5)

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14 Corner solutions are chosen if $g - w < 0 \Rightarrow t_{2|n}^* = 0$ or $-2 \cdot \theta \cdot f \cdot \bar{t} + (g - w) > 0 \Rightarrow t_{2|n}^* = \bar{t}$.

15 Corner solutions emerge for $g - s \cdot w < 0 \Rightarrow t_{2|c}^* = 0$ or $-2 \cdot \theta \cdot f \cdot \bar{t} + (g - s \cdot w) > 0 \Rightarrow t_{2|c}^* = \bar{t}$.
E[\pi_2|c] denotes the expected second period payoff in the state of conviction (given optimal time allocations in this state) and comes to

\[
\left( g - s \cdot w \right)^2 \frac{1}{4 \cdot \theta \cdot f} + s \cdot w \cdot \bar{t}.
\]

E[\pi_2|n] represents the respective expected payoff in the state of non-conviction (given optimal time allocations) and is given by

\[
\left( g - w \right)^2 \frac{1}{4 \cdot \theta \cdot f} + w \cdot \bar{t}.
\]

Clearly, for \( s < 1 \) and \( t^*_2|c < \bar{t} \), the expected payoff in the state of conviction is lower than the expected one in the state of non-conviction, as legal wages are reduced.

The interior solution\(^{16}\) to the maximization of (5) is given by

\[
t^*_1 = \frac{g - w}{2 \cdot \theta \cdot f} + \frac{\theta}{2 \cdot \theta \cdot f} \cdot E[\pi_2|c] - \frac{\theta}{2 \cdot \theta \cdot f} \cdot E[\pi_2|n].
\]

\(^{16}\) Corner solutions are chosen if \((g - w) + \theta \cdot (E[\pi_2|c] - E[\pi_2|n]) < 0 \Rightarrow t^*_1 = 0 \) or \((g - w) + \theta \cdot (E[\pi_2|c] - E[\pi_2|n]) - 2 \cdot \theta \cdot f \cdot \bar{t} > 0 \Rightarrow t^*_1 = \bar{t}.

The first main result of the paper can now be established.

**Proposition 1.** If stigmatization exists,\(^{17}\) there are two opposite effects resulting from stronger stigmatization:

1. **On the one hand,** an unconvicted individual’s illegal time is reduced (deterrence effect).
2. **Whereas on the other hand,** a convicted individual’s illegal time is raised (recidivism effect).

**Proof.** Part 1:

\[
\frac{\partial}{\partial s} (t^*_1) = \frac{w}{2 \cdot \theta \cdot f} \left[ \bar{t} - \frac{g - s \cdot w}{2 \cdot \theta \cdot f} \right]
\]

which is larger than zero for \( t^*_2|c < \bar{t} \) and zero otherwise (recall that increasing \( s \) means less stigmatization).

Part 2:

\[
\frac{\partial}{\partial s} (t^*_2|c) = -\frac{w}{2 \cdot \theta \cdot f}.
\]

The intuition behind Proposition 1 is straightforward: For an unconvicted individual, the threat of stronger stigmatization presents a greater potential loss of legal earning.

\(^{17}\) There are some exceptions where the expected payoff does not depend on the level of stigma. First, this is the case for an unconvicted individual in period two, and secondly, for an individual choosing \( t^*_2|c = \bar{t} \). For the latter case, stigmatization has no effect on the optimal illegal time because this criminal chooses no legal time in the period after conviction. Therefore, earning opportunities are not reduced through stigma, hence the irrelevance of stigma for his optimal time allocations.
opportunities. Therefore, there is a strong incentive to reduce the risk of becoming stigmatized by spending less time on illegal activities in period one. On the other hand, stronger stigmatization reduces legal wages of an already convicted offender. Therefore, illegal activities become relatively more attractive and the substitution of legal through illegal time is the rational consequence.

In view of these opposed effects, it is unclear whether stronger stigma raises or lowers total expected illegal time. The conditions, under which the former or latter holds true, are established in Proposition 2.

**Proposition 2.**

1. *Ceteris paribus,* stronger stigma reduces the expected sum of illegal time if

   \[
   (t - t_2^*) + \theta \cdot (t - t_2^*) \cdot (t_1^* - t_2^*) > 0.
   \]

2. The expected illegal time increases due to stronger stigmatization if

   \[
   (t - t_2^*) + \theta \cdot (t - t_2^*) \cdot (t_1^* - t_2^*) < 0.
   \]

3. The derivative of the left-hand term with respect to \( w \) is positive and with respect to \( g \) negative. Therefore, high legal and low illegal wages foster the effectiveness of stigma in reducing crime.

**Proof.** Proposition 2 follows directly from differentiating an individual’s expected illegal lifetime \( (E[t^*] = t_1^* + (\theta \cdot t_1^* \cdot t_2^* + (1 - \theta \cdot t_1^*) \cdot t_2^*)) \) with respect to \( s \).

Therefore, findings of current research, which propose stigma as an effective crime-deterrent, must be taxed as premature. However, can different punishment of first and repeat offenders be used in order to eliminate the undesirable recidivism effect of stronger stigma?

### 2.2. Extension: Different punishment for first and repeat offenders

Let us enrich the analysis undertaken thus far by allowing for different punishment for first and repeat offenders. \( f_1 \) denotes the marginal penalty of a first time convicted offender, \( f_2 \) the one of an offender convicted for the second time.

**Proposition 3.** \( \exists f_2 \) with \( \frac{\partial}{\partial s}(E[t^*]) < 0 \) for \( f_2 > f_2 \).

Proposition 3 states that with harsh enough punishment for repeat offenders, stigma proves to be effective. Proposition 3 holds because deterrence of unconvicted individuals is stronger with higher \( f_2 \)

\[
\left( \frac{\partial}{\partial s}(t_1^*) = \frac{w}{2 \cdot f_1} \cdot \left[ t - \frac{g - s \cdot w}{2 \cdot \theta \cdot f_2} \right] \right),
\]
but also because the recidivism effect is smaller with increased $f_2$
\[
\left( \frac{\partial}{\partial s} (t^*_2) \right) = -\frac{w}{2 \cdot \theta \cdot f_2}.
\]
Therefore, the threat of harsh enough punishment for repeat offenders mitigates the negative-incentive effect of stigma, which stems from the ex-convict’s drive towards recidivism.\(^{18}\)

By analyzing punishment of first and repeat offenders in a context of stigma being present, I also provide a powerful justification as to why the practice of punishing repeat offenders more severely than first offenders may be efficient: It reduces the higher propensity towards crime after conviction.

Up so far, economists have encountered difficulties finding an explanation as to why in practice, repeat offenders are punished harsher than first offenders.\(^ {19}\) However, all the studies assume that legal and illegal earning opportunities are the same before and after conviction, which is unlikely due to stigmatization.

3. The general case: Illegal earning opportunities inside and outside the legal workplace

In this Section I extend the basic model by allowing illegal earning opportunities to be present on and off the workplace. Therefore, an individual can allocate a fixed amount of working time $t$ to illegal activities at work ($t_w$), to illegal activities outside the workplace ($t$), or to legal activities ($\tilde{t} - t_w - t$). In analogy to Section 2, the probability of conviction is now given by $p = \theta \cdot (t + t_w)$, the penalty by $F = f \cdot (t + t_w)$, the legal earning function by $L = w \cdot (\tilde{t} - t)$\(^ {20}\) and total illegal earnings by $G = g \cdot t + g_w \cdot t_w$. For a convicted criminal, the legal return function is reduced to $L = s \cdot w \cdot (\tilde{t} - t), s \in [0, 1]$ and illegal earnings are newly given by $G = g \cdot t + g_w(s) \cdot t_w$. Since illegal earning

\(^{18}\)Note that if the assumption of equal marginal probability of conviction for first and repeat offenders is relaxed, increasing the marginal probability of conviction for repeat offenders (e.g. through stronger supervision) might improve stigma’s effectiveness in a similar way than higher punishment for repeat offenders.

\(^{19}\)See Polinsky and Rubinfeld (1991), Rubinstein (1980), Burnovsky and Safra (1994), Chu, et al. (2000) and Emons (2003). The only exception is Dana (2001): Dana (2001) points out that the fear of losing reputation after conviction is the greatest for an unconvicted offender. Therefore, deterrence through non-legal sanctions becomes less effective after conviction, which might justify higher legal/formal penalties. In my two-period model, Dana’s (2001) argument is implicitly captured because a threat of wage-reduction (stigma) only exists for an unconvicted offender. In addition to this lacking threat of another wage reduction after conviction (future penalty), I stress that legal and illegal earning opportunities immediately change in a way which fosters recidivism. Hence, another rationale for higher punishment of repeat offenders is provided. Apart from the conclusions concerning punishment of repeat offenders, my analysis is very different from Dana (2001). In Dana’s (2001) study, informal punishment is treated as exogenous and uncontrollable by the government. Therefore, the point that allowing for stigmatization may create negative-incentive problems on crime has not been made and consequently, neither was the search for solutions to this problem a point of discussion.

\(^{20}\)Again, it is assumed that the employee receives a fixed hourly wage $w$. If there was a strict pay-for-performance system, legal and illegal earnings at work might become substitutes to a certain degree.
opportunities at work might be affected by the presence of a (non-empty) criminal record, $g_w = g_w(s)$.

While Section 2 represented the special case with $g_w = 0$, I start with the polar case where illegal earning opportunities are exclusively present at work ($g = 0$).

### 3.1. Illegal earning opportunities only at the workplace

Again, the potential criminal maximizes his expected utility in each period and therefore spends

$$t^*_w = \frac{g_w}{2 \cdot \theta \cdot f_1} - \frac{\theta}{2 \cdot \theta \cdot f_1} \cdot (E[\pi_2|u] - E[\pi_2|c]),$$

$t^*_{w|u} = g_w/2 \cdot \theta \cdot f_1$ and $t^*_{w|c} = g_w(s)/2 \cdot \theta \cdot f_2$ on illegal activities at work (given interior solutions). In order to evaluate the effect of stigma on crime, it has to be determined to what extent illegal earning opportunities are affected by the presence of a criminal record ($g_w(s)$ in $t^*_{w|c}$).

First of all, we know that due to heterogeneity in illegal gains (see footnote 12), conviction is a signal of high illegal gains at work. Therefore, an employer pays an ex-convict a wage $s \cdot w$, which equals the expected output $x \cdot q \cdot ((\hat{t} - \hat{t}_{w|c})/\hat{t})$ minus the expected harm from crimes being committed at work $\hat{g}_w/s \cdot \hat{t}_{w|c}/\hat{t}$ (a hat denotes estimated values, since $g_w$ is unknown to the employer).

Since a criminal record reveals information about past offenses committed, it helps an employer estimating the illegal gains, a potential employee has at work. Ideally, a criminal record is “fully informative”, i.e. it allows to correctly estimate the illegal gains $\hat{g}_w = g_w$. In this case, it is a straightforward point that with illegal gains exceeding a certain threshold level $\tilde{g}_w$, the employer is no more willing to employ the ex-convict ($s = 0$). Illegal gains thus depend on the degree of stigmatization as follows:

$$g_w(s) = \begin{cases} 0 & \text{if } s = 0 \iff g_w \geq \tilde{g}_w, \\ g_w & \text{if } s > 0 \iff g_w < \tilde{g}_w. \end{cases}$$

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21 The higher $g_w$, the more time a criminal ceteris paribus spends on illegal activities and the higher is his probability of conviction.

22 The output prize is set equal to 1. $\alpha$ is the expected productivity discount of a convicted compared to an unconvicted offender (see page 7).

23 The focus here is on crimes, which benefit the offender but do harm to the firm (e.g. stealing at the workplace). There might be certain corporate crimes, which benefit the firm at least in the sort run (e.g. building a cartel, see Garoupa, 2000). However, whether the employer would react totally different in that case (e.g. by not sanctioning (or even rewarding) a new manager previously convicted of such a crime) seems questionable.

24 $\tilde{g}_w$ is the positive solution to

$$x \cdot q - x \cdot q \cdot \frac{g_w}{2 \cdot \theta \cdot f_2 \cdot \hat{t}} = \frac{g_w^2}{2 \cdot \theta \cdot f_2 \cdot \hat{t}} = 0.$$

The term on the left is obtained by plugging in $\hat{t}_{w|c} = g_w/2 \cdot \theta \cdot f_2$ into the wage function.
Therefore, stigma exerts a *precaution function* by excluding the ex-convict from workplaces with high illegal earning opportunities. Proposition 4 summarizes the most important implications of this model.

**Proposition 4.** If illegal earning opportunities are only present at work and a criminal record is fully informative, stigma affects behavior as follows:  

1. Stigma deters unconvicted offenders (deterrence effect)
2. Stigma reduces recidivism (precaution effect)

**Proof.** Part A. Since stigma decreases legal and illegal earning opportunities after conviction, higher stigma increases \( E[\pi_2|_n] - E[\pi_2|_c] \), and hence decreases the incentive to allocate time to illegal activities in period 1.

Part B. Since \( t^*_w|_c = g_w(s)/2 \cdot \theta \cdot f_2 \) and \( \partial g_w/\partial s \geq 0, \partial t^*_w|_c/\partial s \geq 0 \) (recall that increasing \( s \) means less stigmatization).

Therefore, while stigma increases recidivism if illegal earnings are unrelated to the legal workplace, the opposite might occur if illegal earning opportunities are only present at work.

Note also that for \( g_w < \tilde{g}_w \), the employer is willing to employ the ex-convict at a wage

\[
s \cdot w = z \cdot q - z \cdot q \cdot \frac{g_w}{2 \cdot \theta \cdot f_2 \cdot t} - \frac{g_w^2}{2 \cdot \theta \cdot f_2 \cdot t}.
\]

As can be seen from the wage function, the degree of stigmatization (compared to an unconvicted criminal’s wage \( q \)) is the lower, the higher the formal punishment of repeat offenders. Since the employer anticipates that a higher punishment in case of recidivism decreases the likelihood of crimes being committed at work, the wage reduction gets smaller. In this case, informal punishment turns out to be a *strategic substitute* to formal punishment.

### 3.2. Illegal earning opportunities inside and outside the workplace

Even though in this general model, illegal earning opportunities are available in two different markets (inside and outside the workplace), it is generally not optimal for a criminal to operate in both illegal markets in one single period. Since both types of illegal activities have the same marginal cost functions, the individual selects the illegal activity with the higher marginal return.  

For instance, if \( g-w > g_w \), a criminal only spends time on illegal activities outside the workplace, before and after conviction. On the other hand, if \( g-w < g_w \), an unconvicted offender focuses on illegal activities

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25 Again, only the cases are considered where there is any impact, cf. footnote 17.
26 Only in the case of equal marginal returns, activities in both illegal markets might occur simultaneously. Otherwise, due to the linear structure of the model (constant marginal returns), corner solutions result.
27 Stigmatization makes illegal activities outside the workplace relatively more attractive to legal and illegal activities within the firm. This is so because \( g-s \cdot w \geq g-w \), but \( g_w(s) \leq g_w \).
At work, but may switch to illegal activities outside the firm after conviction (e.g. if \( g(s) = 0 \) and \( g - s \cdot w > 0 \)).

As for the effect of stigma on crime, it clearly serves as a deterrent for unconvicted individuals. Again, stigmatization reduces legal as well as possibly illegal earnings. Therefore, an unconvicted individual has an incentive to reduce the risk of becoming convicted and stigmatized by spending less time on illegal activities. For an already convicted offender, the effect of stigma depends on the market, the criminal is operating in. If before conviction, crimes were committed outside the workplace, stigma enhances recidivism (recidivism effect); see footnote 27. On the other hand, if the unconvicted offender had higher illegal returns at work, stigma reduces recidivism, as long as the criminal does not change the market (precaution effect).\(^{28}\) However, if stigmatization induces the offender to abandon crimes at work in favor of illegal activities outside the workplace, the impact on illegal time is a priori not clear.\(^{29}\) Therefore, the strength of stigma’s precaution effect depends on how easily illegal earnings at work may be substituted by illegal earnings outside the workplace.

4. Discussion

The fact that ex-convicts face different conditions on the labor market than employees with a blank criminal record has been widely recognized. Yet, the implications drawn for stigmatization policy differ sharply between countries. While the States facilitate the access to criminal information, Switzerland pursues a policy of restricting criminal information. Next to these polar cases “full stigmatization” (for certain offenses), “no stigmatization” (for certain offenses), there are countries which are located somewhere in between: Spain, for example, gives criminal records to the labor market, but wage-subsidies for ex-convicts are granted in certain situations.\(^{30}\)

The model outlined in this paper provides a theoretical framework for analyzing and understanding the complex relationship between stigma and crime. By showing that stigma exerts different effects on unconvicted (deterrence) and convicted offenders (recidivism, precaution), the model captures the different rationales behind differing stigmatization policies.

According to my model, the American stigmatization policy has a strong deterrence effect on unconvicted offenders. At the same time, it might have a high degree of recidivism of stigmatized ex-convicts. The Spanish solution contributes to reduce the recidivism-effect, since it de-facto weakens the amount of stigmatization. Unfortunately, it reduces deterrence as well since unconvicted offenders anticipate the less devastating consequences on the labor market after conviction. The Swiss model, finally, suppresses stigma’s deterrence function for the offenses excluded from the criminal

\(^{28}\) The necessary condition is \( g_w(s) > g - s \cdot w \).

\(^{29}\) If \( g - s \cdot w > g_w \), stigma increased illegal time, whereas for \( g - s \cdot w < g_w \), it reduced illegal time.

record. Simultaneously, it increases the ex-convicts’ incentive to apply for legitimate work.

As such, it remains unclear at the theoretical level, which policy is most beneficial in terms of crime deterrence. In fact, I showed that the only way to guarantee the effectiveness of stigma is to supplement it with harsh enough punishment for repeat offenders. Therefore, the harsher a country’s punishment for recidivists, the more likely is stigma going to be effective.

Even though stigma may deter crime, its employment must not be optimal. Since stigma’s effectiveness has to be bought at potentially costly higher punishment of repeat offenders, stigma (as opposed to fines) is not necessarily a cost-free deterrent. On the other hand, stigma may have a beneficial impact on the efficiency of the labor market next to its function as a crime-deterrent (see Rasmusen, 1996).

It seems that the benefits from stigmatization in terms of (inexpensive) crime reduction and allocative efficiency improvements are the highest if high illegal earning opportunities prevail at the workplace. Since stigma may exclude the ex-convict from jobs with high illegal earnings, there might even be less recidivism in addition to stigma’s deterrent effect. Additionally, the allocative distortions from having employed a criminal rather than a non-criminal worker would be the greatest if a lot of harm could be done at work. Therefore, it seems important to pass on criminal information to those employers, where a connection between an ex-convict’s past offense and future offenses at work is probable and dangerous (an illustrative example is to hand out the information about a former child-molester to the owner of a kindergarten).

For the offenses, which are unrelated to (a certain type of) work, the benefits of stigma are less clear. From an enforcement perspective, the use of stigma is dominated by the use of fines. Not only allow fines to deter crime without social costs, they also enable to relate the penalty to the damage, a postulate which follows from “optimal punishment” (see e.g. Polinsky and Shavell, 1984). Since fines are usually used for punishing mild offenses, replacement of stigma through fines most likely makes sense for these kinds of offenses (as is done in Switzerland). However, there still is a trade-off between optimal enforcement and allocative efficiency. Only in the case where the wage-reduction (stigmatization) reflects the employer’s distaste against hiring criminals (instead of a productivity discount), the consequences in the labor market may be distributional rather than allocative and the “harm” from suppressing stigma smaller.

For future research, I think that a survey which explored in more detail the employers’ reasons for not hiring ex-criminals or reducing their wage (such as precaution, productivity concerns, distaste against criminals etc.) would be helpful for further assessing stigma’s costs and benefits.

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31 See Becker (1968), Polinsky and Shavell (1979, 1984) for optimal crime enforcement in a context of welfare maximization.

32 In contrast, the amount of stigmatization is determined in the labor market (once a criminal record is available) and out of the government’s control. Total punishment may thus no longer be related to the damage of the crime and deviate from optimal punishment as well as from punishment considered as fair (see Polinsky and Shavell’s (2000b) consideration of fairness in the theory of optimal law enforcement).
References


