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Intertemporal preferences in criminal decision making

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Abstract

Rasmusen (1996) presents a model in which employers offer criminals a lower wage compared to non-criminals because a conviction serves a signal of low productivity. In this paper, I propose an extension to the model that endogenizes the decision to become a criminal using intertemporal discounting. The aim is to get a better understanding of criminal decision making, as well as of the consequences of stigmatization. The analysis reveals that less productive individuals, indeed, become criminals. The wage of unconvicted individuals can either rise or fall as a consequence of an increase in criminality. Additionally, wage discrimination based on a conviction has a deterrent effect on crime. However, it has the potential to promote repeat offending. This observation creates the need for a well-balanced policy with respect to the public availability of criminal records and punishment of repeat offenders.

Keywords: *stigmatization; crime; repeat offending; discounting; comparative law*

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1 Introduction

In economic theory, signaling plays a central role in selection. For instance, a university degree is valuable not only because of the contents students have learned, but because it is a signal to employers: having made it through years of college shows that they are hard-working, ambitious, and disciplined individuals. In other words, the perfect employees. Similarly, negative signals exist as well. For example, having been fired from a previous job typically does not look too good on a resume.

Rasmusen (1996) presents a model in which employers pay convicted criminals a lower wage as compared to non-criminals not because they dislike criminals but because a conviction serves as a signal of low productivity. The lower wage serves as a *de facto* punishment of criminals on the labor market. Hence, the stigmatization of criminals can function as a deterrent for crime. To reach these results, he uses a binary model of low- and high-productivity workers in which he assumes that low-productivity workers become criminals first. The analysis by Rasmusen (1996) provides an insightful starting point for understanding the stigmatization of criminals. The next step in this line of research would be to get a better understanding of why it is that low-productivity workers become criminals. Doing so can also provide a better understanding of the forces that make up the stigmatization effect.

In this paper, I endogenize the link between criminality and productivity. I assume that intertemporal preferences and productivity are correlated: people who care less about the future are less productive. As a consequence, less productive individuals experience less deterrence from potential punishment. This makes them more likely to commit crimes. Therefore, convicted criminals have a lower expected productivity as compared to unconvicted individuals and should be paid a lower wage. I find that the wage of criminals increases as more people commit crimes. The wage of unconvicted individuals can either rise or fall as a consequence of an increase in criminality; this result differs significantly from the analysis by Rasmusen (1996).

For the stigmatization effect, I find that it has the potential to reduce crime due to the deterrent effect. However, I also find an unintended consequence: stronger stigmatization has the potential of promoting repeat offending. To reduce repeat offending the punishment of repeat offenders has to be significantly higher than that of first-time offenders if stigmatization is possible. This effect creates a tension between ex-ante and ex-post deterrence of the stigmatization effect: before a crime is committed, the threat of a criminal record serves as an effective deterrent. After the crime has been committed, it would, however, be optimal not to register the crime on a criminal record as to keep the threat of getting a rap sheet in place.

The paper is structured as follows. The next section introduces a more formal description of the model. Then, section 3 presents the analysis of the model. Section 4 applies the insights to a legal comparison between Dutch and American criminal law. Section 5 provides some concluding remarks. Lastly, in the appendix, an extension to the model is presented in which criminal outcomes are also correlated. In this setting, it is possible for the stigmatization effect to reverse. That is, convicted criminals earn a higher wage than non-criminals.

The remainder of this section first provides theoretical evidence for the existence of the stigmatization effect. Then it presents four stylized facts which form the basis of the model presented in this paper. Lastly, it offers some alternative explanations for the crime-productivity relationship.

The hypothesis is that convicted criminals will have worse labor market outcomes because of stigmatization. Laub and Sampson (1993) find that being incarcerated as a juvenile has a significant negative effect on future job stability. Furthermore, Western (2002) finds that a 10% wage decrease is associated with being incarcerated. Pager (2007) argues that there are three potential explanations for this relationship. First, the individuals that decide to become criminals are just less capable and therefore would have had worse labor market outcomes even had they not

been incarcerated (*selection*). Secondly, the experience of being imprisoned has altered personality traits which result in worse outcomes (*transformation*). Lastly, being convicted imposes a negative stigma which creates barriers on the labor market (*negative credentialing*).

Pager (2007) then goes on to test whether the credentialing effect does exist in absence of selection. By using an in-person audit study of 350 vacancies, she determines that equally qualified individuals have a significantly lower call-back rate when the individual has been convicted as compared to not being convicted. This result is similar to the results obtained by Schwartz and Skolnick (1962) in their correspondence test of resumes. They conclude that stigmatization exists in the absence of a difference in the quality of the employee. However, this distinction seems pointless. If there would be no difference in the productivity of an equally qualified criminal as compared to a non-criminal, employers should be indifferent. Pager herself argues that "[i]n the case of ex-offenders, employers may perceive numerous risks associated with these hires, thus motivating a rejection of ex-offender applicant regardless of the employer's personal feelings." This implies that there are unobservable differences between criminals and non-criminals that affect job performance. Stigmatization, therefore, has the potential to increase efficiency in the labor market as it reduces information asymmetries.

Notwithstanding the potential efficiency gain, stigmatization is typically considered to be an undesirable force; it makes reintegration more difficult for ex-convicts (Jacobs & Crepet, 2008). Stigmatization creates a self-fulfilling prophecy: employers expect criminals to act like criminals, which reduces the opportunities in a legal line of work and, thus, forces these ex-criminals to act like criminals. This is a fair critique for stigmatization. On the one hand, it has the potential to reduce crime due to its deterrent effect. On the other hand, it may force ex-offenders back into crime. The focus of this paper is, however, the direct effect of stigmatization and not the vicious circle it might create.

1.1 Delinquency, IQ, discounting, and productivity

The relationship between discounting and intertemporal preferences I propose is roughly based on four stylized facts.

Firstly, criminality is correlated with lower levels of intelligence. Herrnstein (1995) finds a negative relationship between IQ and criminality in the United States. On average, criminals score 8 IQ-point lower than non-criminals. Similar results are found by White, Moffitt, and Silva (1989) in a study into youth delinquency in New Zealand. Their results are based on a longitudinal study in which both socio-economic factors as well as psychological factors, were measured at ages 3, 5, 7, 9, 11, 13, and 15. IQ was measured at ages 7, 9, 11, and 13. The results suggest that for both risk and non-risk groups, IQ has a significant effect on the delinquency rate. Lynam, Moffitt, and Stouthamer-Loeber (1993), too, find a negative relation of 8 IQ points and delinquency. When controlling for socio-economic factors, the effect is reduced but becomes more significant.

Secondly, Criminality is correlated with more impulsive behaviour. Using the Iowa gambling task, Yechiam et al. (2008) found that criminals tend to choose disadvantageous options more often than non-criminals. Moreover, they were able to identify two mechanisms by which the choices were made. Specifically, drug and sex offenders put more weight on potential gains as compared to potential losses. This behavior is comparable to cocaine-addicts. Secondly, criminals involved in violent crimes (i.e., assault and murder) tend to focus on immediate outcomes.

Thirdly, IQ is correlated with intertemporal preferences. Shamosh and Gray (2008) analyzed the effects on delay discounting (i.e., the preference for small, fast rewards rather than later larger rewards). Using results from 24 separate studies, they conclude that intelligence is a strong predictor of delay discounting ($R = -0.23$). It should, however, be noted that most studies depend on correlation rather than on causation (Urminsky & Zauberman, 2015) and should, therefore, be interpreted as such.

Lastly, IQ is correlated with productivity. Jones and Schneider (2010) show that IQ is positively correlated with productivity. An 1 point IQ increase is associated with a 1% wage increase. Moreover, this result is significant, even when controlling for education.

So, criminals tend to have low IQ, which is associated with stronger discounting of future pay-offs. Additionally, having a low IQ is associated with lower productivity in legal jobs.

1.2 Alternative explanations for the criminality-IQ relation

Statistical discrimination

Statistical discrimination is similar to the vicious cycle described by Pager (2007). Coate and Loury (1993) and later Lang and Manove (2011) argue that members of minority groups are less willing to invest in education because they know they will be discriminated against on the labor market. Hence, their return on investment is lower, and as such, a lower level of education is optimal.

Similar logic could be applied to the criminality-IQ relation: because criminals know they will be stigmatized in the legal labor market (and, therefore, will be facing a lower wage), they are less willing to invest in their education. This would explain why delinquents perform worse on IQ-tests. However, this argument does not tell the entire story. Especially, White et al. (1989) present a convincing argument. In their study, IQ was measured before individuals became criminals. This implies that the ex-post explanation of statistical discrimination is not all that matters. Criminals already had a lower IQ before being discriminated. This result in no way suggests that statistical discrimination is not applicable; the existence of both an ex-ante and ex-post relation between criminality and IQ is not mutually exclusive. However, it does suggest that there is a need for an ex-ante explanation too. The stigmatization model can offer that explanation.

Statistical interference

Since the 1970s a multitude of research has been published that tries to explain the IQ delinquency relation as being spurious. Lynam et al. (1993) gives an overview of the most common arguments. Firstly, Low IQ criminals may be more likely to get caught than their high IQ peers. Therefore, the sample is skewed. However, Moffitt and Silva (1988) find no statistical difference in IQ between delinquents that had been caught by police and delinquents that had not.

The second common explanation is that a third variable influences both IQ and delinquency. However, controlling for the main other explaining variables, like socio-economic background, still results in a significant relation between IQ and delinquency (Lynam et al., 1993).

Further explanations

Another typical explanation is the criminal lifestyle argument. The basic line of thought is that criminals tend to be involved in fights more often, which may cause head injuries, which lowers intelligence. Also, drug abuse may have cognitive effects. However, many empirical studies (e.g., Lynam et al., 1993; White et al., 1989) base their results on teenagers for whom this criminal lifestyle seems quite far fetched. The adverse effects of being criminal just could not have affected these individuals when IQ was measured.

Lastly, it has been suggested that a lower IQ is correlated with the so-called lack of executive function, meaning a lack of self-control. Additionally, a lack of executive function is correlated with delinquency as well. Lynam et al. (1993) estimate that this can explain between 17 and 23% of the IQ-criminality relationship. Still, this is not necessarily a problem for the discounting model I am proposing. The discount factor could just as easily be interpreted as the amount of self-control. An individual with less executive function cares less about the negative consequence of their action, which is qualitatively the same as caring less about a negative impact on future pay-offs.

2 Model

Consider a population of risk-neutral employers and workers. Employers decide on the wage they are willing to pay an employee. Workers can choose to commit a crime or not. The model consists of two periods: period 0, in which a criminal opportunity arises, and period 1, in which all workers work in a legal line of employment.

All individuals are homogenous except for their level of intelligence. Higher intelligence increases an individual's discount factor, δ_i , and productivity in a legitimate job, m_i , but has no impact on productivity as a criminal.¹ Intertemporal preferences are distributed uniformly across the population so that $\delta_i \sim \mathcal{U}(\delta^{min}, \delta^{max})$. For simplicity, I assume that the discount factor and productivity in legitimate jobs are directly correlated. Productivity is a linear function of the discount factor: $m_i = m(\delta_i) = k\delta_i$. As a consequence, also productivity is uniformly distributed so that $m_i \sim \mathcal{U}(m^{min}, m^{max})$. Lastly, intelligence is private information and cannot be observed by employers.

During period 0, all individuals are offered a criminal opportunity. If the individual decides to commit the crime, he earns a direct payoff of $R \geq 0$, which is independent of the number of criminals. If one decides to commit a crime, he is caught and convicted with probability α . After conviction, the criminal receives a punishment $P \geq 0$ during period 1.² Moreover, a convicted criminal also gets a criminal record which, depending on the setting, can be observable by employers.

Then, in period 1, all individuals work a legal job. Employers have to determine an individual's wage. I assume it is either too expensive or even impossible to observe an individual's productivity. Neither employers nor workers have bargaining power. The wage is, therefore, equal to an individual's expected productivity.³ Let w_{uc} denote the wage of unconvicted individuals and w_c the wage of convicted criminals. The pay-off for a non-criminal is:

$$\pi_i^{nc} = \delta_i w_{uc}$$

The expected pay-off of a criminal is:

$$\pi_i^c = R + \delta_i [\alpha(w_c - P) + (1 - \alpha)w_{uc}]$$

¹The appendix presents an extension of the model which allows for the correlation of IQ and criminal outcomes. Only a strong correlation will have a qualitative impact: it is possible for the stigmatization effect to reverse.

²The punishment takes place in the next period for two reasons. First of all, there typically exists a delay between a crime and the punishment. Secondly, in absence of stigmatization, either everyone or no one would commit a crime if the punishment and crime occur in the same period since all individuals are homogenous except for their discount factor. Not only is that an unrealistic result, it also does not allow for a comparison between the setting with and without stigmatization.

Additionally, it should be noted that in the current setup the punishment and future income are discounted equally. Including a different level of discounting for the punishment and future income would only alter their relative weight. The quantitative results would be changed, not the qualitative.

³Here I should note that both legal employment and the punishment take place during period 1. One could argue that convicted criminals have less time to work in a legitimate job since part of period 1 is lost to a prison sentence or community service. Since the focus of this paper is stigmatization, I, however, assume that the punishment does not affect available time. Only stigmatization - not a difference in available time - causes a difference in the wage of convicted and non-convicted criminals. Moreover, including the time-effect would alter the quantitative results of the model but not the qualitative results; less income due to less available time can easily be modeled by increasing the value of the punishment.

3 Analysis

Section 3.1 presents the results for a setting in which criminal records are not accessible by employers, which makes stigmatization impossible. Then, section 3.2 introduces the stigmatization effect. Section 3.3 compares the two settings, and in section 3.4, the consequences for repeat offending are considered.

3.1 Sealed criminal records

When criminal records are not available for employers, it is impossible to differentiate between criminals and non-criminals. Employers pay each worker the same wage, which is the expected productivity of all workers:

$$w = \frac{m^{min} + m^{max}}{2} \quad (1)$$

Since the wage with and without a conviction is equal, the participation constraint to commit a crime in period 1 is fundamentally the same condition as introduced by Becker (1968) with the inclusion of the discount factor. Hence, an individual commits a crime if and only if:

$$R \geq \delta_i \alpha P \quad (2)$$

Which gives the equilibrium condition:

$$\delta_i \leq \frac{R}{\alpha P} = \delta_{ns}^* \quad (3)$$

This equation has two important insights. Firstly, since the discount factor and intelligence are positively correlated, only less intelligent individuals commit crimes. Secondly, this result only holds if and only if $\delta_{ns}^* \in [\delta^{min}, \delta^{max}]$. When δ_{ns}^* is outside of this range, one of two corner solutions can occur. If $\delta_{ns}^* < \delta^{min}$ no one commits a crime because either the expected reward is sufficiently small, the expected punishment sufficiently large, or both. Vice versa, if $\delta_{ns}^* \geq \delta^{max}$ all individuals commit a crime.

3.2 Public criminal records

Now suppose that criminal records are publicly accessible. It becomes possible for employers to offer convicted criminals a different wage compared to unconvicted individuals. This allows for stigmatization. First, I consider the participation constraint during period 0, after which I introduce the wages of both groups.

An individual commits a crime if and only if:

$$R + \delta_i(\alpha(w_c - P) + (1 - \alpha)w_{uc}) \geq \delta_i w_{uc} \quad (4)$$

Which again gives the equilibrium condition:

$$\delta_i \leq \frac{R}{\alpha(w_{uc} - w_c + P)} = \delta_s^*(w_{uc}, w_c) \quad (5)$$

This result is very similar to the situation without stigmatization in equation 3, the difference being that the punishment is raised with the stigmatization effect. The stigmatization effect is the difference between the wage of convicted and unconvicted individuals. To determine the effect of stigmatization, we must, therefore, first determine the wages. The wage of convicted

individuals is straightforward since this group only consists of criminals. The convicted wage is equal to the expected productivity of a criminal:

$$w_c = \frac{m^{min} + m_s^*}{2} = \frac{k(\delta^{min} + \delta_s^*)}{2} \quad (6)$$

Clearly, an increase in δ_s^* - or in other words, an increase in the proportion of criminals in society - raises the wage of convicted criminals. Let θ denote the proportion of criminals in society, so $\theta = \frac{\delta^* - \delta^{min}}{\delta^{max} - \delta^{min}}$. For unconvicted individuals, the determination of the wage is more complicated. This group is composed of both low-productivity unconvicted criminals (proportion $(1 - \alpha)\theta$) and high-productivity non-criminals (proportion $1 - \theta$). Hence, an individual is unconvicted with probability $1 - \alpha\theta$. Given these probabilities, the wage of unconvicted individuals is:⁴

$$w_{uc} = w_c + \frac{1 - \theta}{1 - \alpha\theta} \frac{k(\delta^{max} - \delta^{min})}{2} \quad (7)$$

This is a very intuitive result. Unconvicted individuals earn the wage of convicted criminals plus the stigmatization effect. This difference consists of two parts; $\frac{1 - \theta}{1 - \alpha\theta}$ which is the likelihood that an unconvicted individual actually is not a criminal and $\frac{k(\delta^{max} - \delta^{min})}{2}$ which is the productivity difference between criminals and non-criminals.

However, the effect of a change in the level of criminality on the unconvicted wage is not unambiguous as it consists of two parts: (1) the productivity effect and (2) the selection effect. On the one hand, as δ_s^* increases, the expected productivity of both criminals and non-criminals increases, which raises the wage. On the other hand, higher levels of δ_s^* also imply that the likelihood of hiring non-criminals decreases, hence, giving the lower productivity of unconvicted criminals more weight in the determination of the unconvicted wage.

To solve this ambiguity, consider the two corner solutions: no-one is a criminal, or everyone is a criminal. First of all, if no-one commits a crime, the unconvicted wage is exactly equal to the average productivity $\frac{k(\delta^{min} + \delta^{max})}{2}$ as stigmatization is impossible. Now as the level of criminality rises, some low-productivity criminals are moved out of the group of unconvicted individuals due to their conviction. The change increases the expected productivity of unconvicted individuals which result in a wage increase. This is the productivity effect.

Secondly, consider the full crime equilibrium where all individuals are criminals. In this setting, the characteristics of the members of the convicted and unconvicted group are equal. Each group has the same expected productivity. Both w_c and w_{uc} are equal to the average productivity $\frac{k(\delta^{min} + \delta^{max})}{2}$. Now suppose the level of criminality drops slightly. This creates an inequality in the characteristics of the two groups. Some high-productivity individuals are moved from the convicted group to the unconvicted group as they do not commit a crime. The expected productivity of the unconvicted rises and that of the convicted falls. Consequently, the unconvicted wage increases; the convicted wage decreases.

As the level of criminality rises, the unconvicted wage will at first diverge from the average productivity and later converge again. Finally, consider the turning point where the unconvicted wage flips from increasing to decreasing. In this point, the productivity effect will not outweigh the increased probability of hiring a low-productivity unconvicted criminal. On the one hand, if an additional non-criminal decides to commit a crime this increases productivity of the group of non-criminals. On the other hand, the number of non-criminals decreases while the number of unconvicted criminals increases. So the probability of hiring a non-criminal falls while the probability of hiring a unconvicted criminal increases. When the increased productivity (productivity effect) does not compensate for the negative effect of the increased probability of hiring a low-productivity criminal (selection effect), the wages starts to drop.

⁴ $w_{uc} = \frac{(1 - \alpha)\theta}{1 - \alpha\theta} \frac{m^{min} + m_s^*}{2} + \frac{1 - \theta}{1 - \alpha\theta} \frac{m_s^* + m^{max}}{2} = \frac{(1 - \alpha)\theta}{1 - \alpha\theta} w_c + \frac{1 - \theta}{1 - \alpha\theta} (w_c + \frac{m^{max} - m^{min}}{2}) = w_c + \frac{1 - \theta}{1 - \alpha\theta} \frac{k(\delta^{max} - \delta^{min})}{2}$

To summarize, as the level of criminality increases, w_{uc} increases at first and starts to fall again after the selection effect outweighs the productivity effect. Figure 1 depicts this relationship. The result is to be contrasted with the finding of Rasmusen (1996). He concludes that the unconvicted wage falls as more productive individuals become criminals. In contrast to this model, Ramusen uses a binary case for productivity rather than a continuous function. Consequently, there either is stigmatization or not. My analysis reveals that the result is quite sensitive to this assumption. Only for a specific range of θ the unconvicted wage is decreasing.

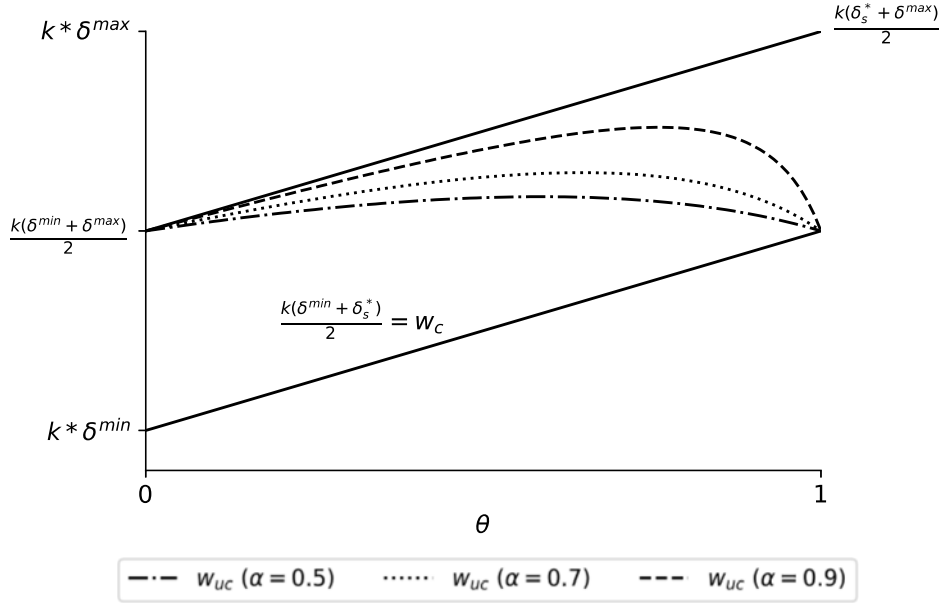


Figure 1: The convicted and unconvicted wage as a function of θ

The trade-off between the selection and productivity effect is also evident in the first order derivative of w_{uc} with respect to θ :

$$\frac{\partial w_{uc}}{\partial \theta} = \frac{k(\delta^{max} - \delta^{min})}{2} \left(1 - \frac{1 - \alpha}{(1 - \alpha\theta)^2}\right) \quad (8)$$

On the one hand w_{uc} is increasing with the constant productivity effect $\frac{k(\delta^{max} - \delta^{min})}{2}$.⁵ On the other hand, w_{uc} is increasingly affected by the selection effect $-\frac{1 - \alpha}{(1 - \alpha\theta)^2} \frac{k(\delta^{max} - \delta^{min})}{2}$ as θ rises. Moreover, the level of θ at which the selection effect becomes stronger than the productivity effect only depends on the probability of being caught: w_{uc} increases as long as $\theta < \frac{1 - \sqrt{1 - \alpha}}{\alpha}$.⁶ This makes sense. If the probability of being caught increases, criminal records become more accurate. Consequently, criminals and non-criminals are better separated. It creates more certainty for employers which allows them to pay a higher wage to unconvicted criminals.

Lastly, from equation 8, it is also clear that the stigmatization effect is strictly decreasing in θ and, therefore, in δ_s^* since $\frac{\partial w_{uc}}{\partial \theta} < \frac{\partial w_c}{\partial \theta}$. However, it never falls below zero as $\frac{1 - \theta}{1 - \alpha\theta} = 0$ for $\theta = 1$, so that $w_{uc} \geq w_c, \forall \theta \in [0, 1]$.

⁵Note that the convicted wage is only determined by the productivity effect. Therefore, $\frac{\partial w_c}{\partial \theta} = \frac{k(\delta^{max} - \delta^{min})}{2}$.

⁶The derivative has two solutions for zero: $\theta = \frac{1 - \sqrt{1 - \alpha}}{\alpha}, \alpha \neq 0$ and $\theta = \frac{1 + \sqrt{1 - \alpha}}{\alpha}, \alpha \neq 0$. However, only the former results in a value in the $[0, 1]$ domain by which θ is bound. Also note that the constraint $\alpha \neq 0$ is intuitive since at $\alpha = 0$ there is no stigmatization and therefore, the wage is constant and independent of θ

Equilibria

Unfortunately, solving equation 5 with respect to δ results in a uninformative long expression. Therefore, this section presents a more theoretical discussion of the results. Figures 2 and 3 present the underlying relationship. With stigmatization, there can be either no, one or two solutions for δ_s^* .

First of all, consider the two corner solution: similar to the setting without stigmatization a no-crime equilibrium is a potential outcome ($\delta_s^* < \delta^{min}$) as well as a full-crime equilibrium ($\delta_s^* > \delta^{max}$). Secondly, the internal solution splits up into two cases: (1) the punishment is sufficient to deter some crime by itself ($\delta_{ns}^* < \delta^{max}$), and (2) the punishment is insufficient. If the punishment is sufficient, there is exactly one solution for δ_s^* , which is a stable equilibrium. This is depicted by figure 2.

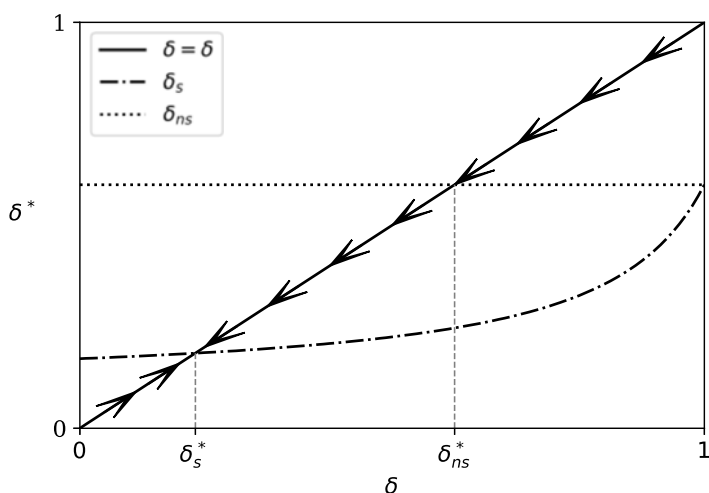


Figure 2: Equilibrium, no high-crime corner solution (Used values: $\alpha = 0.5, P = 10, R = 3, k = 50, \delta_i \sim \mathcal{U}(0, 1)$)

Lastly, consider the setting in which punishment by itself is insufficient to deter any crime ($\delta_{ns}^* > \delta^{max}$). Since δ_{ns}^* and δ_s^* join at δ^{max} , this implies that there is a second intersection between δ_{ns}^* and the 45°-line as depicted in figure 3. As long as the level of δ is below $\delta_{s,1}^*$, the level of crime increases as the least intelligent non-criminal can still increase their expected pay-off by becoming a criminal. Intuitively, to the right of $\delta_{s,1}^*$ the level of crime should fall since the marginal criminal can now increase his pay-off by not being a criminal. Yet, this relationship breaks down after $\delta_{s,2}^*$: the stigmatisation effect decreases to a level where the sum of the punishment and stigmatization is insufficiently large to deter the marginal criminal so that $\delta < \delta_s^*$. To conclude, as long as the level of δ in society is below $\delta_{s,2}^*$, δ converges to the stable equilibrium of $\delta_{s,1}^*$. If the level of δ is larger, $\delta_{s,2}^*$ is not a stable equilibrium, and society converges to the full crime corner solution.

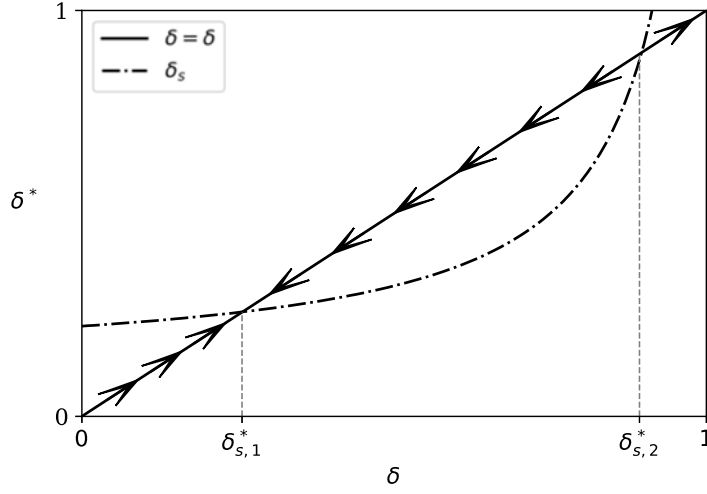


Figure 3: Equilibrium, potential high-crime corner solution (Used values: $\alpha = 0.5, P = 2, R = 3, k = 50, \delta_i \sim \mathcal{U}(0, 1)$)

3.3 Comparison

Since the stigmatization effect is non-negative per definition, it holds that deterrence with stigmatization is always stronger. As a consequence, δ_s^* must be below the level of δ_{ns}^* , *ceteris paribus*. The proportion of criminals in society falls by $\frac{\delta_{ns}^* - \delta_s^*}{\delta^{max} - \delta^{min}}$ when stigmatization is introduced. To consider the effect of stigmatization on an individuals decision to become a criminal, three ranges of δ should be defined:

- Individuals who care very little about the future so that $\delta_i \leq \delta_s^*$ always commit crimes irrespective of the stigmatization effect.
- Individuals with a moderate appreciation of the future so that $\delta_s^* < \delta_i \leq \delta_{ns}^*$ cannot deterred by punishment alone. However, the addition of the stigmatization effect is sufficient to deter this group from crime.
- Individuals who care strongly about future payoffs so that $\delta_{ns}^* < \delta_i$ do not commit crimes irrespective of the stigmatization effect.

3.4 Repeat offenders

Finally, consider the effect of stigmatization on the incentives for repeat offenders. Even though this is not an explicit element of the model, nor can it easily be added, the model creates a sufficiently robust framework that allows for a more general discussion. Consider a second criminal opportunity that arises after completion of the sentence. In the absence of stigmatization, the incentives remain unchanged as the participation decision only depends on the ratio between the reward and expected punishment. If one was willing to commit the crime before, this still is true. Now, reducing repeat offending is straightforward: even a trivially small increase in the punishment of repeat offenders should at least deter some individuals from committing further crimes.

This story becomes more complicated when introducing stigmatization. For simplicity, I assume that employers only observe whether someone has been convicted; not the number of convictions. The level of stigmatization is therefore independent of the number of convictions.⁷ For this second criminal opportunity, the incentives have changed significantly compared to the first. Since convicted criminals are already being stigmatized, stigmatization does not serve as a deterrent anymore. Convicted individuals effectively switch from the model with stigmatization to the one without. This change raises the maximum level of δ at which convicted criminals would be willing to commit further crimes. Ergo, an increase in the punishment of repeat offenders is effective for reducing repeat offending if and only if it is larger than the stigmatization effect that a first time offenders face.

This observation creates tension for the optimal policy with regard to the availability of criminal records. Ex-ante, public records provide an excellent deterrent for crime; however, ex-post, it would be optimal not to register a crime on criminal records to keep the deterrent effect of stigmatization in place. It also raises the question of optimal policy. Stronger ex-ante deterrence through stigmatization comes at the cost of the requirement of harsher punishments for repeat offenders. This trade-off is very evident in the next section which compares the Dutch and American criminal justice systems.

Finally, let me consider the effect on unconvicted criminals. Again, if there is no possibility for stigmatization, the incentives remain unchanged compared to the first crime. However, if criminal records are publicly accessible, the incentives do change. To see why this is true, take the following proof of contradiction. Assume that δ_{ns}^* remains unchanged. All unconvicted criminals commit a second crime. As a consequence the fraction of unconvicted criminals in society falls from $(1 - \alpha)\theta$ to $(1 - \alpha)^2\theta$. Subsequently, w_{uc} increases due to the selection effect: the probability of hiring a non criminal falls, raising the expected productivity of unconvicted individuals. This effectively increases the stigmatization effect and must, therefore, lower δ_{ns}^* . This conclusion is a contradiction with the initial assumption. Hence, the stigmatization effect increases as repeat offending is more prominent. Rational actors should account for this increase in stigmatization when deciding to commit their first crime. If there is a possibility for repeat offending less people should commit a first crime due to the increased stigmatization effect.

⁷This is a very stylized assumption. However, the argument could just as well have been made using the number of convictions. In that instance, an additional conviction further increases the level of stigmatization. Intuitively, the marginal stigmatization effect should be decreasing in the number of crimes. As a consequence, the same effect occurs as described in the text: the marginal expected punishment of committing an additional crime becomes smaller than that of the previous crime.

4 Economic analysis of criminal law

This section makes a comparison between the American and Dutch criminal justice system. I specifically focus on policies surrounding repeat offenders. The two domains that will be discussed are policies to reduce repeat offending and the availability of criminal records. The section starts with a general overview of the legal frameworks and then applies the insights from section 3.4 to understand the differences.

4.1 Possibilities for stigmatization: public criminal records

In order to determine the extent in which stigmatization is possible, the accessibility of criminal records has to be determined. When discussing criminal records, two factors should be considered: (1) the extent to which these records are publicly available and (2) the period of retention. I first consider the US system, followed by the Dutch system.

The United States has shown a strong tendency towards more accessible public records over the last fifty years. This happened because of both legal and technological developments. First of all, it should be noted that there are three different sources of criminal records: criminal record repositories maintained by law enforcement agencies, court records, and commercial information vendors.⁸ The most obvious source of criminal records, the criminal record repositories, used to be only accessible for law enforcement purposes. Since the 1970s, especially during the 1990s and in the aftermath of 9/11, legislation has been passed to make the repositories available to the public.⁹ The extent to which these databases can be used differs significantly between states.

Even if the criminal repositories in a state are not accessible, that does not mean that criminal records are not available. The public has a right to inspect court records¹⁰ which not only contain convictions but rather all criminal court records (even cases that did not result in convictions) and sometimes arrest records too. Historically, court records did not provide for a good source to determine someone's criminal history since these records could only be obtained if one knew the exact court where the proceedings took place. However, due to digitalization,¹¹ court records can now typically be found in online state-wide databases. Additionally, commercial information vendors have developed databases that combine both the criminal record repositories and court records from numerous states. These databases make criminal background searches even more accessible. Lastly, there is a minor limit on the availability of juvenile records. Juvenile records can be sealed or expunged when turning 18 years old. This effectively allow for a fresh start; a do-over. However, Jacobs and Crepet (2008) find that the commercial databases have rendered this policy increasingly ineffective. If a minor's record was added to these databases before being sealed or expunged, it often remains in these databases, effectively taking away the possibility of fresh start.

This strategy makes for a sharp contrast with the more lenient Dutch system. First of all, criminal records are not directly publicly accessible. Employers can request a *Verklaring Omtrent Gedrag (VOG)* (translation: statement about behavior). The offenses that can come up on a VOG are limited in time and scope. First of all, only offenses that happened in the last four years are considered; just two years for individuals younger than 23 years of age. There are some exceptions, however. For instance, for certain job-types, the period is increased (i.e., 30 years for judges and ten years for individuals working at nuclear reactors). Moreover, sexually

⁸For a more extensive overview of the accessibility of criminal records in the USA, see Jacobs and Crepet (2008).

⁹Again, (Jacobs & Crepet, 2008) give a more extensive overview of these legal developments.

¹⁰See for example *Nixon v. Warner Communications, Inc.*, 435 US 589, 597 (1978): "It is clear that the courts of this country recognize a general right to inspect and copy public records and documents, including judicial records and documents."

¹¹Digitalization happened because of technological progress, as well as federal mandates. See for example the E-Government Act of 2002

based offenses are not limited in time. Aside from the time restriction, there is also a limitation in scope. In other words, only related offenses to the job at hand come up. For example, a traffic offense would come up when applying for a job as a taxi driver but not necessarily for a primary school teacher.

Clearly, there is a significant difference in the Dutch and US approach. The American system provides for a stronger ex-ante incentive as criminal records are more easily accessible. The Dutch provides for a weaker ex-ante incentive but gains a stronger ex-post incentive. Especially the limited time frame in the Dutch system is an enticing finding in light of the ex-post deterrence. Generally, earning potential increases with age (Lazear, 1976; Murphy & Welch, 1990). In other words, a thirty-year-old is expected to have a better income than a twenty-year-old. As a consequence, the potential income loss due to stigmatization increases with age.¹² Therefore, it is sensible to reintroduce the stigmatization as individuals get older.

4.2 Punishment of repeat offenders

As described in section 3.4, in the case of stigmatization, repeat offending can only be reduced by increasing the expected punishment. As the American system provides more possibilities for stigmatization due to more accessible criminal records, my theory predicts that punishment for repeat offenders should be harsher in the United States as compared to the Netherlands. This section discusses multiple policies that aim to reduce repeat offending. Even though there are similarities between the American and Dutch approach, there is clear evidence to support my hypothesis.

First of all, both systems make use of suspended sentences. These suspended sentences are, in light of this model, an excellent tool to reduce repeat offending as it merely increases the punishment of a next crime. Moreover, it comes at the benefit of reducing the cost of the initial punishment. However, it is not all good. One could also argue that suspended sentences reduce the deterrence to commit the first crime. In other words, had the first sentence not been suspended, the individual may not have committed the initial crime in the first place. Hence, suspended sentences may reduce repeat offending but, possibly, at the cost of increasing the number of first-time offenders.

An alternative method is to increase the expected punishment of committing further crimes without altering the punishment for the first offense. The best-known example of such a policy are the American habitual offender laws - better known as the three-strikes laws - which typically increase sentences for second-time offenders and introduce minimum sentences of 15 or 25 years to life imprisonment for third-time offenders.¹³ Even though the use of such laws has recently been reduced,¹⁴ the three strikes laws remain a steady policy for serious or violent felonies. Using such a policy makes perfect sense considering the model at hand. It significantly increases the punishment for repeat offenders, which is needed to reduce the criminal activity of this group. However, whether these policies are cost-effective is another question. Moreover, the measure may be very useful for deterrence, but it seems to have lost all connection with the other two purposes of punishment (i.e., retribution and rehabilitation) as well as the proportionality with the crime.

This American policy forms a sharp contrast with the Dutch criminal justice system, where as a general rule, minimum sentences are not used. Nevertheless, the Dutch system also makes

¹²This increase in stigmatization effect is apparent in the model as k can be interpreted as the earning potential. It can be clearly seen in equation 7 that stigmatization is a linear function of k . Hence, an increase in k , and, therefore, the earning potential increases the stigmatization effect.

¹³Again, there are significant differences between federal and state laws. These differences include the level of punishment but also the felonies that are covered by the statutes.

¹⁴Changes include the exclusion of minor offenses and drug offenses from the three strike count as well as the introduction of the possibility of parole. *See for example* California's 2012 approved Proposition 36 and the more recent federal First Steps Act (2019).

use of specific measures to target habitual offenders. A good example is the so-called ISD-measure¹⁵ which targets minor offenses. If one has committed three felonies during the last five years, this measure can be applied. In short, it consists of a one- to two-year prison sentence which is meant for treatment and rehabilitation (usually the prison sentence for these offenses would be too short to properly treat the individuals). If this treatment focusses on increasing δ_i , this measure could be very efficient. In addition, it increases the expected punishment.¹⁶ A similar measure does not exist for more severe felonies. However, maximum prison sentences are increased for repeat offenders (Mevis, 2013). In recent years attempts have been made to introduce minimum sentences for repeat offenders.¹⁷

Finally, another possibility to increase the expected punishment is by increasing the detection of crimes. Both the US and the Netherlands employ parole offices to fulfill this task. Recently, the Netherlands increased the extent and duration of parole for serious felonies.¹⁸

4.3 Conclusion

The Dutch and American criminal justice systems clearly take different approaches with respect to stigmatization and repeat offenders. The American system is more reliant on harsh punishments to deter repeat offending as compared to the Dutch system. Given the more accessible criminal records in the United States, this conclusion is consistent with the predictions in section 3.4. The Dutch system keeps more deterrence from the stigmatization effect in place after the first crime. It, however, comes at the cost of less deterrence due to stigmatization for first-time offenders.

It should be noted that the basic model, as presented in section 3.4 does not suggest a strong preference for either ex-post or ex-ante deterrence through stigmatization. What really matters is the coherence between the policies on accessibility of criminal records and deterrence of repeat offending. Both the American and Dutch systems seem to strike this balance. More accessible criminal records should be paired with stronger punishments for repeat offenders.

Nevertheless, two policy recommendations can be made. First of all, rehabilitation should play an important factor in reducing repeat offending. Treating offenders in programs that aim to reduce impulsiveness and promote self-control are an excellent tool for increasing δ_i . From the perspective of the offender, this raises expected future punishment and should, therefore, be able to deter further crimes. Secondly, the wage-age correlation does at least suggest some preference for criminal records that are limited in time. As wages increase with age, the stigmatization effect also gets stronger. Again, the trade-off between ex-ante and ex-post deterrence is applicable. Time limited criminal records imply that the stigmatization effect now is reduced at the benefit of a stronger stigmatization effect later on due to a higher wage gap between the convicted and unconvicted wage.

¹⁵Maatregel Inrichting Stelselmatige daders (artikel 38m Sr)

¹⁶Also note the similarity in the timeframe for both ISD and VOG.

¹⁷See for example TK33151, nr. 3 and TK34846, nr. 3

¹⁸Wet langdurig toezicht, gedragsbeïnvloeding en vrijheidsbeperking (in effect since January 1, 2018).

5 Concluding remarks

The model used in this paper has elaborated on the model introduced by (Rasmusen, 1996). It has introduced an endogenous link between criminality and productivity as well as by making the productivity levels continuous rather than binary. Doing so allowed for a better understanding of why some individuals become while others do not. Moreover, it gives a more complete view of the stigmatization effect.

I found that as the level of criminality rises, the convicted wage is increasing. The effect on the unconvicted wage is more complicated. At first, it increases due to the productivity effect. Later on, it starts to decline again due to the selection effect. The extent to which the unconvicted wage can increase only depends on the probability of being caught. In other words, as the quality of criminal records gets better, the unconvicted wage and stigmatization effect will increase. Moreover, the model provides for conclusive proof that the stigmatization effect will have a deterrent effect on first-time offenders.

An unintended consequence of stigmatization is that punishments for repeat offenders will need to increase significantly to deter repeat offenders. It creates a tension for the optimal level of stigmatization from an ex-ante versus ex-post perspective. Before a crime is committed the threat of a criminal record is a good deterrent; however, after the crime, it would be optimal not to register the crime as to keep the deterrent effect in place. From a policy perspective, this is an important consideration. Even more important, though, is striking the right balance between stigmatization and punishment of repeat offenders. As shown in the comparison between the Netherlands and the United States, punishment of repeat offenders should increase as public records become more accessible.

References

- Becker, G. S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76(2), 169-217.
- Coate, S., & Loury, G. (1993). Will Affirmative-Action Policies Eliminate Negative Stereotypes? *The American Economic Review*, 83(5), 1220-1240.
- Hernstein, R. (1995). Criminogenic Traits. In J. Q. Wilson & J. Petersilia (Eds.), *Crime* (pp. 39-64). San Francisco: ICS Press.
- Jacobs, J., & Crepet, T. (2008). The Expanding Scope, Use, and Availability of Criminal Records. *New York University Journal of Legislation and Public Policy*, 11(2), 177-214.
- Jones, G., & Schneider, W. J. (2010). IQ in the production function: Evidence from immigrant earnings. *Economic Inquiry*, 48(3), 743-755.
- Lang, K., & Manove, M. (2011). Education and labor market discrimination. *American Economic Review*, 101(4), 1467-1496.
- Laub, J. H., & Sampson, R. J. (1993). Turning Points in the Life Course: Why Change Matters to the Study of Crime. *Criminology*, 31(3), 301-326.
- Lazear, E. (1976). Age, Experience, and Wage Growth. *The American Economic Review*, 66(4), 548-558.
- Lynam, D., Moffitt, T. E., & Stouthamer-Loeber, M. (1993). Explaining the Relation Between IQ and Delinquency : Class, Race, Test Motivation, School Failure, or Self-Control? *Journal of Abnormal Psychology*, 102(2), 187-196.
- Mevis, P. A. M. (2013). *Capita Strafrecht* (7th ed.). Nijmegen: Ars Aequi Libri.
- Moffitt, T. E., & Silva, P. A. (1988). IQ and Delinquency: A Direct Test of the Differential Detection Hypothesis. *Journal of Abnormal Psychology*, 97(3), 330-333.
- Murphy, K. M., & Welch, F. (1990). Empirical Age-Earnings Profiles. *Journal of Labor Economics*, 8(2), 202-229.
- Pager, D. (2007). *Marked: Race, Crime and Finding Work in an Era of Mass Incarceration* (1st ed.). Chicago: University of Chicago Press.
- Rasmusen, E. (1996). Stigma and Self-Fulfilling Expectations of Criminality. *The Journal of Law & Economics*, 39, 519-544.
- Schwartz, R. D., & Skolnick, J. H. (1962). Two Studies of Legal Stigma. *Social Problems*, 10(2), 133-142.
- Shamosh, N. A., & Gray, J. R. (2008). Delay discounting and intelligence: A meta-analysis. *Intelligence*, 36(4), 289-305.
- Urminsky, O., & Zauberman, G. (2015). The Psychology of Intertemporal Preferences. In G. Keren & G. Wu (Eds.), *Wiley-blackwell handbook of judgment and decision making* (pp. 141-181). Malden, MA: Wiley-Blackwell.
- Western, B. (2002). The Impact of Incarceration on Wage Mobility and Inequality. *American Sociological Review*, 67(4), 526-546.
- White, J. L., Moffitt, T. E., & Silva, P. A. (1989). A Prospective Replication of the Protective Effects of IQ in Subjects at High Risk for Juvenile Delinquency. *Journal of Consulting and Clinical Psychology*, 57(6), 719-724.
- Yechiam, E., Kanz, J. E., Bechara, A., Stout, J. C., Busemeyer, J. R., Altmaier, E. M., & Paulsen, J. S. (2008). Neurocognitive deficits related to poor decision making in people behind bars. *Psychonomic Bulletin and Review*, 15(1), 44-51.

Appendix - Correlated criminal outcomes

Weak correlation between intelligence and reward

First consider a case in which the reward is only weakly correlated with intelligence. In this case a criminal earns reward $R + r(\delta)$ where $r'(\delta) > 0$, $\frac{r'(\delta)}{\alpha P} < 1$,¹⁹ and $r(\delta^{min}) = 0$. If there is no possibility for stigmatization, an individual only commits a crime if and only if:

$$\delta_i \leq \frac{R + r(\delta_i)}{\alpha P} = \hat{\delta}_{ns} \quad (9)$$

Notice that in equilibrium, there are more criminals compared to the situation with the uncorrelated reward since $R + r(\delta_s^*) > R$. However, the main insight still holds: individuals who value the future less become criminals, and those who value the future sufficiently not. Similarly, with stigmatization, an individual commits a crime if and only if:

$$\delta_i \leq \frac{R + r(\delta_i)}{\alpha(w_{uc} - w_c + P)} = \hat{\delta}_s \quad (10)$$

In this instance, the relative increase in the number of criminals (from the standard uncorrelated model) is likely larger compared to the setting without stigmatization. As before, the higher reward of the marginal criminal increases the level of criminality. Additionally, the stigmatization effect is reduced as the higher crime rate increases w_c , further increasing the equilibrium level of crime. A weak correlation between the reward and intelligence only has a quantitative effect; not a qualitative.

Lastly, note that the assumption that the reward is equal to $R + r(\delta_i)$ creates a mechanical increase: the marginal criminal has a higher pay-off with correlation compared to no correlation per definition. However, even if we relax this assumption, the conclusion that the effect is only quantitative and not qualitative still holds. If the reward of the marginal criminal is lower with a correlation compared to no correlation, this results in a decrease in the level of crime. However, it does not change the dynamics of the model: still the least intelligent individuals become criminals.

Strong correlation between intelligence and reward

To show the effects of a strong correlation between intelligence and reward, I limit my analysis to a binary case with high and low-intelligence individuals. High-intelligence individuals discount the future with factor δ_H , have productivity m_H in a legal job and earn reward R_H when committing a crime. For low-intelligence individuals, these are denoted by δ_L , m_L and R_L . As follows from the model, $\delta_H > \delta_L$, $m_H > m_L$ and now also $R_H > R_L$. This setup allows for the stigmatization effect, under specific conditions, to reverse (i.e., criminals earn a higher wage compared to unconvicted individuals). It then is possible for the stigmatization effect to increase the proportion of criminals. To see this, consider a setting in which low-intelligence individuals are unwilling to commit crimes in absence stigmatization ($\delta_L > \frac{R_L}{\alpha P}$) and high-intelligence individuals are always willing to commit crimes ($\delta_H < \frac{R_H}{\alpha P}$).²⁰ If we now introduce the stigmatization effect and only high-intelligence individuals commit crimes, being convicted becomes a signal of high-productivity. Hence, the wage of convicted individuals becomes equal to

¹⁹Including the condition $\frac{r'(\delta)}{\alpha P} < 1$ rules out the possibility for a reversal of the stigmatization effect, as is the case for a strong correlation. A reversal is possible if and only if $\frac{\partial}{\partial \delta} \frac{R+r(\delta)}{\alpha P} > \frac{\partial}{\partial \delta} \delta = 1 \Leftrightarrow \frac{r'(\delta)}{\alpha P} > 1$.

²⁰Note that the second condition is not strictly necessary; even if high-intelligence individuals are unwilling to commit crimes in the absence of stigmatization, the reversed stigmatization effect could give sufficient incentives for them to commit crimes. However, the benefit of assuming that this group is always willing to commit crimes is that their decision is now independent of the choice made by low-intelligence individuals.

m_H , and the wage of unconvicted individuals to the weighted average of the productivity of low-productivity individuals and unconvicted high-productivity individuals. As a consequence, $w_c > w_{uc}$, and therefore, the stigmatization effect is positive. It reduces the expected punishment. Now two potential equilibria can arise:

- $\delta_L \geq \frac{R_L}{\alpha(P+(w_c-w_{uc}))}$ in which case the stigmatization effect reduces the punishment to an insufficient level to induce low-intelligence individuals to become criminals. Therefore, only high-productivity individuals commit crimes.
- $\delta_L < \frac{R_L}{\alpha(P+(w_c-w_{uc}))}$ in which case the stigmatization effect causes a sufficient decrease in the punishment for low-intelligence individuals to become criminals. However, as these low-intelligence criminals are convicted, this lowers w_c and increases w_{uc} , therefore, reducing the stigmatization effect. If all low-intelligence individuals would become criminals, the outcome would equal that of the setting without stigmatization in which it was suboptimal for these individuals to become criminals. Therefore, there is a mixed equilibrium: some part of the low-intelligence individuals become criminals, the remainder not.

Correlation between intelligence and the probability of being caught

When we assume it is not the criminal reward that is correlated with intelligence, but rather the probability of being caught, the results should be similar. After all, a lower expected punishment has the same effect on the expected pay-off, as has a higher expected reward. Accordingly, in absence of stigmatization, the effects are the same as described above. However, when including stigmatization, the argument has to be altered slightly. If high-intelligence individuals become criminals, their impact on the convicted wage is weaker. Only a small proportion of these high-intelligence criminals are convicted and their weight in the determination of the convicted wage is relatively small. Hence, in the case with a weak correlation, the reduction of the stigmatization effect is smaller compared to the setting with correlated rewards.

This effect is even more apparent when there is a strong correlation between intelligence and the probability of being caught. Again consider the example above in which only high-intelligence individuals become criminals (i.e., $\delta_L > \frac{R}{\alpha_L P}$ and $\delta_H < \frac{R}{\alpha_H P}$). Still, the wage of convicted criminals is equal to m_H . Now, if less intelligent individuals decide to become criminals too, w_c decreases much faster compared to the setting with correlated rewards as these less productive individuals have a much stronger weight in the determination of the convicted. Consequently, less low-intelligence individuals are tempted to become criminals.

Conclusion

By introducing some form of correlation between the outcome as a criminal and one's intelligence, it is possible for the model to reverse so that only highly productive individuals become criminals. The setting with no or only weak correlation between intelligence and criminal outcomes is best suited to explain blue collar crime, whereas the setting with strong correlations might be best for explaining white-collar crime. This observation has important policy implications: stigmatization is effective for reducing blue-collar crime but may, in fact, promote white-collar crime.