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by

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Thomas J. Miceli*

Abstract: The question of whether or not offenders' gains should be counted in social welfare dates back to Stigler's original critique of the Becker model, but the debate has generally been carried out within the context of optimal law enforcement, while taking the content of law as given. This paper extends the discussion to the question of what acts should be made illegal. It does this by viewing the Becker model of crime through the lens of the Coase-Calabresi-Melamed framework for assigning and protecting legal entitlements in conflicting-use situations. The practice of civil disobedience—the breaking of laws deemed to be unjust—is discussed in light of the analysis.

Key words: Economics of crime, offenders' benefits, law enforcement, lawmaking, civil disobedience
JEL codes: K14, K42

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1 Introduction

The question of whether or not offenders' gains should be counted in social welfare has primarily been asked within the context of optimal law enforcement—the issue of how much expense should be devoted to apprehending and punishing offenders—while taking the content of the law as given. This paper extends that debate to the problem of law*making* by examining how it affects the determination of what harmful acts should be designated as crimes in the first place. I will undertake this exercise by viewing the Becker (1968) model of crime through the lens of the Coase-Calabresi-Melamed (CCM) framework for assigning and protecting legal entitlements in conflicting-use situations (Coase, 1960; Calabresi and Melamed, 1972). The chief insight to be gained from this perspective, I will argue, is its recognition of the reciprocal nature of external harms, and its corresponding implication that the identities of the "offender" and "victim" are themselves relative. Once that idea is acknowledged, the position that offenders' gains shouldn't count in welfare, depending as it does on moral absolutism, becomes a more difficult one to sustain.

The issue of how to deal with offenders' gains was first raised by Stigler (1970) in his critique of Becker's decision to include those gains as a component of social welfare. As Stigler noted, Becker did this in part to escape the conclusion that greater deterrence can always be achieved in his framework with little or no expenditure of additional resources by simply raising the severity of punishment. This is obviously true of fines, which can be raised costlessly, but it is also true for non-monetary sanctions because the probability of apprehension can always be proportionally scaled back as the punishment is increased, thereby holding expected punishment

costs fixed while lowering the cost of apprehension.[1] Faced with this result, Becker introduced "as a different limitation on punishment the 'social value of the gain to offenders'." Stigler suggested, however, that it is not clear why society places value on such gains. Although certain criminal acts no doubt provide a benefit to society, "such social gains seem too infrequent, small, and capricious to put an effective limitation upon the size of punishments" (Stigler, 1970, p. 527).[2]

But there was a more fundamental reason for Becker's inclusion of offender gains in welfare; namely, his view that "criminal activities are an important subset of the class of activities that cause diseconomies" (Becker, 1968, p. 173). In other words, crimes are just another form of harmful externality. This is an understandable impulse, especially from an economist who made his career by expanding the application of economic analysis beyond the traditional boundaries.[3] Most of the economics-of-crime literature since Becker has followed his lead in this respect. Although authors occasionally acknowledge the controversial nature of counting offenders' gains (usually in a footnote), they quickly add that the only impact of excluding these gains would be quantitative.[4]

The chief argument against counting offenders' gains is based on a moral theory of law, which holds that "the inclusion of criminal gains is an ethical judgment" (Lewin and Trumbull,

[1] This conclusion, that optimal sanctions are maximal, has proven to be one of the most robust results of the Becker model (see, for example, Polinsky and Shavell (2007)). However, it is also one of the points of greatest departure of the model's prescriptions from actual criminal justice policy. See, for example, Miceli (2019, pp. 38-43).
[2] Stigler argued that yet another explanation for bounds on punishment is the need to maintain marginal deterrence, an observation that has itself generated a large literature. See, for example, Polinsky and Shavell (2007, pp. 432-434).
[3] See, for example, Becker (2005).
[4] In particular, it would lead to greater enforcement and/or more severe punishment. See, for example, Shavell (1985) and Polinsky and Shavell (2007). Curry and Doyle (2016) take a different perspective. Following up on Posner's (1985) argument that criminal law is aimed at preventing market bypass, they show that when offenders have a legal option for obtaining the benefits that they can also get from crime, welfare maximization becomes equivalent to minimizing the costs of crime, as is the case when offenders' gains are not counted. Still, criminal gains *are* counted in their model in the sense that they are afforded status in social welfare. Their approach, however, would seem inapplicable to many of the acts that Stigler noted should not be accorded social value.

1990, p. 271), and as such is a question largely outside of economics.[5] It is, of course, indisputable that some policy considerations, morality and ethics among them, are beyond the scope of economic reasoning, but acceptance of that premise with respect to law enforcement policy does not end the debate about offenders' gains. It merely shifts it to the realm of lawmaking, for that is where the determination is made of which harmful acts are socially unacceptable, and hence labeled as criminal. And, as Lewin and Trumbull argue, "the term 'criminal' represents an implicit societal judgment that the conduct has no social value" (p. 280).

Of course, if such judgments were universally and unanimously accepted, there wouldn't be much room for further debate, and economists would be obliged to treat those things labeled as crimes differently from other harmful acts like pollution or accidents. However, as Shavell (2004, p. 548) notes, the "[m]oral theory of criminal law is unable to explain why some criminal acts are less bad morally than some noncriminal acts." This is true because morality is a subjective concept that varies with time and place. Thus, a moral theory of law can at best define the law as it exists, but it cannot explain why it takes the form that it takes as opposed to some alternative structure, except to say that it reflects prevailing views about what is right and wrong. And when morality is encoded in law, it becomes political because in a democratic society, the majority controls the lawmaking apparatus and so gets to decide which acts are punishable by the law; that is, which are labeled as crimes.

In this perspective, the debate about counting offenders' gains ultimately reduces to a political debate about whose values will count in the social calculus. Once that determination is made, the minority is expected to acquiesce to the will of the majority as part of the social

[5] According to Shavell (2004, p. 548), the moral theory of law is "the major alternative explanation for criminal law…" Also see Posner (1985, p. 1194). Both argue, however, that an economic approach is superior because of its greater explanatory power.

contract, the hope being that the diversity of views in a large society prevents the majority from systematically tyrannizing the minority.[6] In the meantime, those people whose interests or beliefs are contrary to the prevailing view of morality must incur a cost from having to obey laws with which they disagree. And if that cost becomes large enough, or if the prospect of overturning an existing law by democratic channels becomes remote enough, opponents may feel compelled, as a last resort, to violate the law.[7] Advocates of the economic model of crime would put these infractions in the category of "efficient crimes," while its critics would label them as immoral acts.

But is there not a point at which violating the law itself becomes a moral imperative? Although most crimes are committed purely for "private" gain, some may be aimed at calling attention to unjust laws. And for those who engage in such violations—referred to as civil disobedience—breaking the law is not immoral; on the contrary, *enforcement* of the law would be. According to this view, morality is a relative concept—or, to apply Coase's terminology, it is "reciprocal" in nature. It follows that, when there are competing views of morality as it pertains to a particular act, "The Real question that has to be decided is, Should A be allowed to harm B or should B be allowed to harm A?" (Coase, 1960, p. 2).

The purpose of this paper is to pursue this line of argument with respect to criminal law by examining the Becker model within the context of the CCM framework. The analysis therefore combines questions of lawmaking and law enforcement by considering both the initial assignment of legal rights, and the determination of the optimal sanction structure for protecting

[6] On the Lockean social contract and its relation to law, see Adelstein (2017, pp. 9-15). The argument about shifting majorities was set forth by Madison in Federalist No. 10 (Hamilton, Jay, and Madison, 2008).
[7] One of the problems with simple majority rule, of course, is that it does not allow voters to express their intensity of preference. Violating the law is one way that individuals can demonstrate that intensity. Thoreau captured this idea in his famous essay on civil disobedience when he said, "any man more right than his neighbors constitutes a majority of one…" (Thoreau, 1965 [1849], p. 645)

that assignment. Of course, this perspective—based as it is on the reciprocal nature of conflicting moral views—only makes sense if offenders' gains are counted in welfare because, as we have noted, the identities of the offender and victim are themselves relative to the prevailing delineation of rights.

This argument is not intended as a refutation of the idea that criminal law has a moral dimension. That is undeniable. Rather, its purpose is to bring to the debate about counting offenders' gains the important insight that harm is not an absolute concept, as seems to be implicit in the moral theory of crime. And when legal change does not keep pace with evolving moral attitudes, breaking the law may itself become a moral necessity, as exemplified by the time-honored status of civil disobedience. True acts of civil disobedience (as distinct from crimes committed purely for private gain) present a real problem for the view that offenders' gains should not be counted in social welfare because they challenge the moral theory of law on its own terms. On the contrary, such acts present no difficulty at all to the economic approach to criminal law precisely because the latter does not seek to categorize harms based on the motives of offenders, but rather to arbitrate among them in a consistent way by establishing an efficient structure (assignment and enforcement) of legal entitlements in the face of conflicting interests.

The remainder of the paper is organized as follows. Section 2 sets the stage by reviewing the debate regarding the counting of offenders' gains. Section 3 then develops the formal analysis, which consists of examining the impact of alternative entitlement points and enforcement rules within the context of the Becker model. For those uninterested in technical details, a numerical example at the conclusion of this section illustrates the key points. Section 4 turns to a discussion of civil disobedience in light of the analysis. Finally, section 5 offers concluding remarks.

2 The Debate Over Offenders' Gains

Becker's (1968) model of crime and punishment is based on maximization of a welfare function that accounts for the costs and benefits of law enforcement. The cost side consists of the resources devoted to apprehending and punishing offenders, while the benefit side consists of the net savings in social harm resulting from criminal activity. Crucially, Becker computes the *net* harm from a criminal act to be the costs incurred by victims less the benefits received by offenders. As noted above, he embraced this definition without reservation as a natural consequence of the view that crime is just another type of externality, and criminal punishment is therefore just a form of Pigovian taxation or liability.

In one of the earliest commentaries on the Becker model, however, Stigler (1970) questioned the assumption that society attaches value to the gain of criminal offenders:

> The determination of this social value is not explained, and one is entitled to doubt its usefulness as an explanatory concept: what evidence is there that society sets a positive value upon the utility derived from a murder, rape, or arson? In fact the society has branded the utility derived from such activities as illicit (p. 527).

Lewin and Trumbull (1990) argued even more forcefully for the position that criminal gains should *not* be counted in social welfare. They did so by challenging the perspective that crime is merely an externality, and that "the criminal law is nothing more than a pricing mechanism to internalize externalities" (p. 281). To the contrary, they argued that

> One distinguishing feature of criminal law is its moral foundation. The law both reflects and shapes public morality. The stigma of criminality is not simply a social cost to the offender without any corresponding social benefit … This stigmatization represents part of the punishment that is inflicted for purposes of retribution. In conjunction with other aspects of punishment, stigmatization also serves an educational value-shaping function, signaling that certain acts are prohibited…(p. 281).

This last point, regarding the educational role of law, reflects its so-called "expressive function," which is the idea that one purpose of the law is to instruct people about what acts are and are not socially acceptable. This idea is perhaps most clearly articulated by the great legal scholar H.L.A Hart (1982, p. 6), who asked, "Why are certain kinds of actions forbidden by law and so made crimes or offences? The answer is: To announce to society that these actions are not to be done and to secure that fewer of them are done."[8] Inevitably, this view of law reflects morality as it is understood by society at a particular time and place. Oliver Wendell Holmes (1897, p. 49), for example, famously observed that "The law is witness and external deposit of our moral life. Its history is the history of the moral development of the race." Hart (1961, p. 181) likewise noted that "it cannot seriously be disputed that the development of law, at all times and places, has in fact been profoundly influenced…by the conventional morality and ideals of particular groups."

This line of argument, however, merely begs the question of what acts should be prohibited, and on what basis that determination should be made. It is, after all, tautological to say that criminal law is aimed at forbidding immoral acts, and as such, it is a question outside of the scope of economics.[9] In their discussion of various possible reasons for choosing a particular assignment of legal entitlements in conflicting use situations, Calabresi and Melamed (1972) emphasized economic efficiency, but they also offered as an alternative criterion "other justice reasons," though they quickly admitted "that it is hard to know what content can be poured into that term" (p. 1102). Regardless of the justification, once a particular assignment of entitlements

[8] Also see Sunstein (1996), Cooter (1998), Kahan (1998), Shavell (2004, Chapter 27), and Miceli (2019, Chapter 8).
[9] As Posner (1985, p. 1194) notes, "the pervasive evidence placed in the criminal law on … the moral character rather than the consequences of behavior, suggests a decidedly noneconomic perspective." Despite that acknowledgement, he goes on to explain various doctrines of the criminal law as being broadly consistent with the Becker model.

is enshrined in law, the wants of the group that benefits from that assignment are elevated above those of others. And when members of the disadvantaged group violate the established assignment, for whatever reason, their behavior is deemed immoral—by definition.

Friedman (2000) has taken the opposite position in this debate. While acknowledging that crime involves a moral as well as an economic dimension, he argues that the only way we can reach logical conclusions about how to structure the law is to let the theory tell us the answers rather than assuming them at the outset. Specifically,

> If instead of treating all benefits to everyone equally we first sort people into the deserving and the undeserving, the just and the unjust, the criminals and the victims, we are simply assuming our conclusions. Benefits to bad people don't count, so rules against bad people are automatically efficient. We cannot deduce moral conclusions from economics if we start the economics by assuming the moral conclusions (p. 230).

There is no dispute that a multiplicity of values can exist in society, and morality, in whatever way it is defined, may well be ranked above economic efficiency in the hierarchy.[10] But even if the content of the laws is determined independently of economic considerations, economics has a role to play in helping to decide the best way to enforce the desired assignment of rights. The economist in this case is not asked to render judgments about what acts should be categorized as crimes, but only to prescribe the least cost-way of enforcing those laws that have been enacted. Shavell (1985) articulated this view with respect to the question of whether or not to include offender gains in welfare:

> …allowing social benefits to be less than private benefits permits the analyst to take into account society's apparent tendency to impute little value to acts for which private benefits inhere in a party's enjoyment of the disutility suffered by the victim. Where the private benefits (for example, benefits from reaching a destination on time) are not obtained from the enjoyment of victim's disutility, society seems more likely to credit them in the social calculus (p. 1234).

[10] See Shavell (2002) on the relationship between law and morality. Also see Cosgel and Miceli (2019), who examine the emergence of law within a "partially" moral society.

From this perspective, the categorization of prohibited acts is determined by factors outside of economics, with the role of the economist being relegated to determining the most efficient enforcement structure.[11] Nearly all economic analysis of crime since Becker has taken this approach.[12] Although the question of whether or not to count offenders' gains in social welfare must still be answered as part of this undertaking, the decision only has a quantitative impact. As Polinsky and Shavell (2007) note,

> If the gains from some type of harmful conduct were excluded from social welfare, the main consequence for our analysis would be that, for this type of conduct, society would want to achieve greater, possibly complete, deterrence. That, in turn, would tend to make a higher sanction and a higher probability of detection desirable (footnote 8, p. 408).

In other words, the "acceptable" crime rate would be higher or lower depending on whether or not the gains were counted, but those things that are labeled as crimes would remain unaffected.

This is the prevailing view in the literature, and so it is the starting point for the analysis in this paper. The next section takes up the prior question of how the initial assignment of legal rights should be established.

3 Combining Law Enforcement and Lawmaking: Becker Meets Coase

The preceding discussion was meant as a prelude to the main contribution of this paper, which is to blend the Becker model of optimal law enforcement with the Coase-Calabresi-Melamed framework for assigning and protecting legal entitlements in externality settings. As noted above, the Becker model is a "limited" economic theory of crime in the sense that it takes as given the set of prohibited acts and focuses on enforcing the prevailing legal structure in the

[11] In this vein, see Dharmapala and Garoupa (2004), who attach weights to offenders' gains to account for the lower social value associated with crimes motivated by "hate." Garoupa and Klerman (2002), by contrast, discount the *harm* from crimes in the objective function of rent-seeking enforcers, who in their model care mainly about the revenue from fines.

[12] For an exception, see Adelstein (2017).

optimal way. The CCM framework allows us to introduce the lawmaking component into the analysis. The key insight derived from this hybrid approach, as was suggested above, is its recognition of the reciprocal nature of harm, and the implication that the labels of injurer and victim are themselves only determined after the initial assignment of legal entitlements has been set.

As an illustration of this view, consider Coase's example of straying cattle, which cause damage to a neighboring farmer's crop. (The example intentionally lacks a clear moral dimension so as to avoid preconceptions about what the "appropriate" assignment of the entitlement should be.)[13] Assume, as Coase does, that the only choice concerns the herd size, and that the farmer's crop damage is unavoidably increasing in that size. In this setting, the social optimum is determined independently of the legal structure, and depends only on the marginal benefits and costs of adding additional cattle to the herd, assuming, of course, that both are counted in welfare. I will also suppose that transaction costs are sufficiently high as to prohibit Coasian bargaining between the parties as a means of internalizing the externality. Thus, the assignment of legal rights and the associated enforcement policy will be determinative of efficiency.[14]

Suppose initially that the assignment of entitlements is such that ranchers bear no responsibility for crop damage. They are therefore free to let their cattle stray, and farmers must

[13] Still, one might argue that it is the cattle that *physically* cause the harm and so the rancher should be responsible for it. This in fact seems to motivate the definition of property rights espoused by Alchian (1965, p. 818). But what if the cattle ranch were there first? This perspective, which reflects the common law doctrine of "coming to the nuisance," is exemplified by the famous case of *Spur v. Del E. Webb Development Co.* (494 P.2d 701, Ariz. 1972), which is often cited as epitomizing the Calabresi and Melamed framework. The case involved a developer who encroached on a pre-existing cattle feed lot and sued to have it shut down. The court granted the request, but in recognition of the feedlot's temporal priority, it ordered the developer to pay the lot's relocation costs, thereby effectively awarding the legal entitlement to the latter—and consequently labeling the developer as the "cause" of the harm—protected by a liability rule.

[14] See Demsetz (1972) for a general discussion of the question of when the assignment of liability matters for efficiency.

endure the resulting damages as a cost of doing business. In this scenario, the imposition of crop damage is "legal," and so farmers cannot appeal to the law as a means of preventing the harm. And indeed, any steps that they might take on their own to reduce the damage—for example, by killing any cattle that stray onto their land—would themselves be seen as criminal acts that could result in a legal sanction.

This assignment of legal entitlements, which involves no restraint on straying cattle, may or may not be efficient. It depends on the costs of crop damage on one hand versus the cost that ranchers would have to incur to eliminate it by reducing their herds. (I am assuming that this is the only way they can limit straying cattle.) If the cost to the rancher of reducing his herd exceeds the crop damage from straying cattle, then the legality of straying cattle is efficient. On the other hand, if the crop damage is larger, then the opposite assignment of rights, under which it would be a crime for ranchers to allow their cattle to stray, is efficient. In this case, it is the rancher who would have to endure an unavoidable cost in the form of forgone profits.

The point is that the efficient assignment of rights can only be ascertained by comparing the costs and benefits arising from that assignment. Obviously, this approach to lawmaking (i.e., the determination of what acts are labeled as "illegal") falls prey to the critique of Lewin and Trumbull (1990); namely, that crimes are not merely externalities that need to be priced, but are acts that should be categorically prohibited, and the benefits derived therefrom should therefore not be counted in welfare. For example, if it is deemed that allowing one's cattle to stray is morally wrong, then it should be made illegal irrespective of the loss to ranchers from such a rule, and all violations should be prevented to the extent feasible. The same argument would be true in reverse if impeding wandering cattle were seen as "immoral."

The preceding discussion reflects the "least cost avoider" approach to the assignment of liability.[15] Such "corner solutions," however, are not ordinarily efficient. This is why the optimal enforcement policy needs to be augmented by an appropriately-structured sanction schedule that specifies punishments for violations of the initial assignment of legal rights, thereby allowing "efficient violations" (i.e., interior solutions). In other words, the optimal legal structure involves both an initial assignment of rights and an efficient enforcement policy. The remainder of this section undertakes such an exercise within the context of the Becker model by formalizing the preceding example. (Readers uninterested in the technical details can skip directly to the example at the end of the section.)

The model to be employed is similar to that in Shavell (1991), where both harms and benefits are allowed to vary depending on the circumstances. Specifically, let b be the benefit of holding cattle, which is distributed by the density function $f(b)$ on $[0,\infty)$;[16] and let h be the resulting harm to farmers, which is distributed by the density $g(h)$ on $[0,\infty)$.[17] I will focus exclusively on monetary fines as sanctions, and I will assume that the realized value of both the benefit and harm can be observed, so the sanction can be conditioned on b or h, as the situation requires. Finally, I will assume that the sanction is not artificially bounded.[18]

Note that the focus on monetary fines as the legal sanction for illicit acts reflects *liability rule* protection of the established entitlement point, according to the Calabresi and Melamed (1972) framework. This remedy is consistent with the assumption of high transaction costs

[15] See, for example, Shavell (2004, pp. 189-190), discussing a concept that originated with Calabresi's (1970) analysis of accident law.
[16] In the Becker-Polinsky-Shavell model of crime, the distribution of b represents varying gains from distinct acts by different offenders, but it could also represent varying benefits of multiple acts by a single offender. The latter interpretation is more in line with the traditional externality situation, as will be depicted in the numerical example below regarding a rancher's choice of how many cattle to have in his herd.
[17] I assume for simplicity that b and h are independently distributed.
[18] Since s is a fine, it is obviously bounded by the ability of the offender to pay. However, the approach I will employ here will result in a finite optimum for s in all cases.

between the injurer and victim.[19] Initially, we will assume that the fine s can be imposed costlessly and with certainty; later, we will consider the impact of costly enforcement.[20]

3.1 Costless Enforcement

We begin by considering the case where farmers have the right to be free from any losses caused by straying cattle. Given the "illegality" of crop damage, a rancher will add cattle to his herd as long as the benefit exceeds the resulting sanction, or as long as $b \geq s(h)$. The level of social welfare is therefore given by

$$W_1 = \int_0^\infty \int_{s(h)}^\infty (b-h) f(b) g(h) db dh \tag{1}$$

The optimal sanction is found by maximizing (1) with respect to s for all h. Because s can be conditioned on h, the enforcer can simply solve

$$\max_s \int_s^\infty (b-h) f(b) db \tag{2}$$

which yields the solution $s^*=h$.[21] This is the optimal Pigovian sanction. Ranchers will now only add cattle to the point where $b=h$, resulting in "optimal deterrence" of ranching. Because h varies, the size of individual ranchers' herds will depend on how harmful straying cattle are to their particular neighbors (as determined by the realization of h). Taking account of all possible levels of harm, we write the maximized expression for overall welfare under this assignment of rights as

$$W_1^* = \int_0^\infty \int_h^\infty (b-h) f(b) g(h) db dh \tag{3}$$

[19] This is in contrast to property rule protection, under which an entitlement holder can seek injunctive relief from an infringement, possibly as a prelude to Coasian bargaining.
[20] I will, however, assume certain enforcement throughout in order to keep the analysis simple.
[21] This solution reflects optimal *specific enforcement* in Shavell's (1991) sense; that is, optimal enforcement within the category of acts imposing harm of h per crime.

This quantity, which is the net gain from efficient crimes (comprising additions to the rancher's herd and the resulting crop damage), is represented by the region above the 45^0 line in Figure 1.

[Figure 1 here]

Now consider the situation if the entitlement point is switched so as to make crop damage "legal." In this case, the rancher can add cattle to his herd without the possibility of incurring a legal sanction for the resulting damage to the farmer's crops. Suppose, however, that farmers can reduce the herd by, for example, killing any cattle that stray onto their land. Because ranchers have the entitlement to hold as many cattle as they want in this scenario, killing cattle is a crime. In other words, the harms and benefits from the preceding case are now reversed, and so the identities of injurer and victim are also reversed. Specifically, the lost benefit to ranchers, b, is now the "harm" from the prohibited act, while the saved crop damage, h, is the "benefit." We therefore define the sanction in this case to be $s(b)$, which is written as a function of the harm suffered by the rancher from lost cattle.[22]

Proceeding as above, we assume rational farmers will kill cattle as long as $h \geq s(b)$, which results in welfare of

$$W_2 = \int_0^{\infty} \int_0^{s(b)} (b-h)g(h)f(b)dhdb \tag{4}$$

The optimal sanction is chosen to maximize this expression for all b, or to

$$\max_s \int_0^{s} (b-h)g(h)dh \tag{5}$$

[22] We are ruling out a situation in which neither the imposition of crop damage nor killing cattle is considered a crime, as such a scenario is fundamentally inconsistent with an externality situation involving incompatible uses. As Calabresi and Melamed (1972) observe, "When the state is presented with the conflicting interests of two or more people, or two or more groups of people, it must decide which side to favor. Absent such a decision, access to goods, services, and life itself will be decided on the basis of 'might makes right'—whoever is stronger or shrewder will win" (p. 1090). In other words, some form of "self-help" solution will emerge, usually based on force. See Nozick (1974) on the transition from such an anarchical situation to one in which that state acquires a monopoly on enforcement.

Note that this differs from (2) in that the sanction s is the upper bound of the integral, reflecting the criminality of acts by the farmer that *reduce* the number of cattle, rather than acts by the rancher that increase the number. The solution to (5) is $s^*(b)=b$, and the resulting maximized value of welfare for all possible realizations of b is

$$W_2^* = \int_0^\infty \int_0^b (b-h)g(h)f(b)dhdb \qquad (6)$$

As above, the net social benefit is computed to be the joint gain from ranching and farming, or $b-h$. The difference is that here, criminal acts decrease the herd size, whereas in the previous scenario they increased it. In both cases, however, the first-best outcome—in which the net value of holding cattle is maximized—is achieved. Mathematically, the expression in (6) is another way to compute the area above the 45^0 line in Figure 1; it is obtained by reversing the order of integration in (3) and appropriately changing the limits of integration on the inside integral. The definition of "crimes," however, has changed to be those acts by the farmer that reduce the herd, which he efficiently commits when $h>b$, as represented by the area below the 45^0 line in Figure 1.

Note that the equivalence of W_1^* and W_2^* establishes a kind of second-order Coase Theorem that can be stated as follows. When law enforcement is administered perfectly and costlessly, the assignment of criminal entitlements is irrelevant for efficiency. This argument, of course, relies on the inclusion of both benefits and costs in social welfare.

3.2 Costly Enforcement

As with the original Coase Theorem, this irrelevance breaks down when enforcement is costly. To capture this in the simplest possible way, suppose that there is a fixed cost k of apprehending and sanctioning an offender, regardless of the level of harm, though I will assume that apprehension still occurs with certainty and that the sanction s remains unbounded. More

complex enforcement structures could be considered, but that would only complicate the basic message without adding further insight.

In the case where crop damage is a crime, the determination of the optimal sanction in (2) is replaced by

$$\max_{s} \int_{s}^{\infty} (b - h - k) f(b) db \tag{7}$$

The resulting first-order condition is

$$-(s - h - k)f(s) = 0 \tag{8}$$

from which it follows that $s^*(h) = h+k$. Thus, offenders now pay the external damage they cause plus the cost of enforcement.[23] Given this sanction, ranchers will only add those cattle for which $b \geq h+k$, which results in greater deterrence of ranching (smaller herds) as compared to the costless-enforcement case. Maximized welfare in this case is given by

$$\widehat{W}_1 = \int_0^{\infty} \int_{h+k}^{\infty} (b - h - k) f(b) g(h) db dh \tag{9}$$

Forming the difference between (3) and (9) gives

$$W_1^* - \widehat{W}_1 = \int_0^{\infty} \int_{h}^{h+k} (b - h) f(b) g(h) db dh + \int_0^{\infty} \int_{h+k}^{\infty} k f(b) g(h) db dh \tag{10}$$

The first term on the right-hand side is the forgone surplus from those cattle whose value exceeds the corresponding crop damage but which are nevertheless deterred (i.e., those for which $h+k>b>h$). This is the cost of "excessive deterrence," and is shown by the strip labeled "excessive deterrence" in Figure 2. The second term in (10) is the total enforcement cost associated with the "efficient crimes" that are committed by the rancher. The relevant region here is the area above the $b=h+k$ locus labeled "efficient crimes" in Figure 2.

[23]This is the form of a monetary sanction first derived by Becker (1968, p. 192).

[Figure 2 here]

Now suppose that the opposite entitlement point is put in place, under which crop damage is not a crime but killing cattle is. In this case, recall, farmers will kill cattle (i.e., reduce the rancher's herd size) as long as $h \geq s(b)$. The optimal sanction will therefore solve

$$\max_{s} \int_0^s (b-h)g(h)dh - \int_s^\infty kg(h)dh \tag{11}$$

Note how this problem differs from that in (7): the first term here represents the net gain from those cattle that are *not* killed (i.e., those for which $h<s$), while the second term is the enforcement cost for those that are killed (i.e., those for which $h>s$). This difference again reflects the reversal of the definition of what constitutes a crime, from "adding" cattle to "removing" cattle. Still, the solution to (11) mirrors that from the previous scenario—specifically, $s^* = b+k$—and the resulting maximized value of welfare is

$$\widehat{W}_2 = \int_0^\infty \int_0^{b+k} (b-h)g(h)f(b)dhdb - \int_0^\infty \int_{b+k}^\infty kg(h)f(b)dhdb \tag{12}$$

Forming the difference between (6) and (12) gives

$$W_2^* - \widehat{W}_2 = -\int_0^\infty \int_b^{b+k} (b-h)g(h)f(b)dhdb + \int_0^\infty \int_{b+k}^\infty kg(h)f(b)dhdb \tag{13}$$

The first term on the right-hand side is the net cost of excessive holdings of cattle by the rancher, the killing of which has been deterred. In other words, it is the net loss from those cattle that impose more harm than benefit, but which are not eliminated by the farmer because of the threat of sanctioning. The relevant region is shown by the area labeled "excessive deterrence" in Figure 3. Note that this term is positive because $b<h$ everywhere in this region. The second term is the total enforcement cost for those cattle that *are* killed. The relevant region here is the area below the $b=h-k$ locus labeled "efficient crimes" in Figure 3.

[Figure 3 here]

The existence of costly enforcement now adds an asymmetry between the two entitlement points. Either could be preferred; it depends on a comparison between expressions (10) and (13). The optimal assignment of legal entitlements in this case should therefore be chosen to minimize the impact of costly enforcement, consisting of the actual expenditure of costs plus the loss from excessive deterrence.

3.3 An Example

I now illustrate the preceding analysis with a simple numerical example that is adapted from Coase's straying-cattle example. The relevant data are provided in Table 1, where, for purposes of the example, the rancher's herd is capped at four. The farmer's marginal crop damage is assumed to be a constant equal to $15, while the rancher's marginal benefit of adding steers to the herd is a decreasing function of herd size, ranging from $40 for the first steer down to $10 for the fourth. The optimal herd size in this example is three, the number that maximizes the net social benefit of ranching, as shown in the final column. As above I consider the use of a monetary fine, or liability, as the legal sanction, and I initially assume enforcement is costless.

Table 1. Data for the straying cattle example.

Herd size	Marginal damage to crops	Marginal benefit of additional steers	Net social benefit
1	15	40	25
2	15	30	40
3	15	20	45
4	15	10	40

Adapted from Coase (1960).

Following the above analysis, I first consider the case where crop damage is designated as illegal and is therefore subject to legal sanction. The optimal fine here is equal to the constant

marginal crop damage of $15. When faced with this sanction, the rancher will increase his herd size to three, beyond which the marginal benefit of adding additional steers is less than the sanction. Thus, at a herd of three, the rancher's profit, which also coincides with the net social benefit, is maximized. Although crop damage is "illegal" in this scenario, the rancher rationally commits efficient crimes by maintaining a herd of three and imposing $45 worth of harm on the farmer, for which he pays an equivalent fine.[24]

Now consider the opposite assignment of legal rights, which imposes no responsibility for crop damage on the rancher. Thus, he is free to increase his herd size without limit. In this scenario, the imposition of crop damage is therefore "legal," and so, because we are ruling out bargaining, the farmer has no lawful means of preventing the harm. However, he can take steps to reduce the herd by killing cattle, which would be considered "illegal" and subject to a fine. In this case, the optimal fine schedule would reflect lost profits of the rancher, and so would coincide with the marginal benefit schedule in column three of Table 1. Thus, assuming that the herd starts out at its maximal size of four, the farmer would have to pay $10 for killing the first steer, $20 for killing the second, and so on up to a maximum fine of $40. Under this sanction schedule, the farmer will rationally kill only one steer because the benefit from each offense in the form of saved crop damage is equal to $15, which is greater than the cost of killing the first steer ($10) but less than the cost of killing the second ($20) and any subsequent steers. This single offense again constitutes an efficient crime because the benefit to the farmer exceeds the cost to the rancher. And it achieves the efficient herd size of three.

[24] Whether or not the fine is turned over to the farmer as compensation in this case is immaterial. Under tort law it would be, but under criminal law it would not be. The absence of compensation under criminal law is why some crimes are also torts.

Given costless enforcement, both of the preceding assignments of legal entitlements are efficient because they each arrive at the optimal herd size of three. Thus, which activity is "criminalized" is irrelevant for efficiency, reflecting the reciprocal nature of the harm. Although we have ruled out Coasian bargaining between the parties as a solution to the externality, the assumption of zero enforcement costs and an efficient sanction schedule effectively replicates the conclusion of the Coase Theorem regarding the initial setting of criminal rights. In a sense, of course, this is a tautological result because by assuming costless enforcement, we are effectively creating the necessary conditions for the true Coase Theorem, and are therefore merely replacing a consensual bargain with a non-consensual "criminal exchange" that achieves exactly the same outcome.[25] In other words, when the court sets the correct price under a liability rule (monetary sanction), the outcome is equivalent in terms of efficiency to a consensual exchange under a property rule.[26] The key point is that the conclusion is illustrative of the reciprocal nature of costs and benefits—and by extension the labels of offender and victim—in settings where individuals have conflicting interests.

Consider now how the presence of enforcement costs affect this conclusion. Suppose in particular that the cost of detecting and punishing a violator is equal to $3. As we showed above, the optimal fine is now equal to the marginal damage plus this fixed enforcement cost. Thus, under the scenario where crop damage is a crime, the optimal fine is equal to the marginal crop damage plus the fixed enforcement cost, or $18 (=$15+$3). Given the rancher's marginal benefit schedule, it continues to be optimal for him to add three cattle to his herd, resulting in gross profit of $90, total crop damage of $45, and total enforcement costs of $9. The net social

[25] See Adelstein (2017), especially Chapters 8 and 9, which examine crime as exchange. The fact that transaction costs are assumed to be high is what makes "market bypass" by means of a criminal exchange efficient in this case.
[26] See Kaplow and Shavell (1996, pp. 724-725).

gain in this case is therefore \$36 = \$90 − \$45 − \$9. Thus, the only departure from the first-best outcome is due to the cost of enforcement.

Conversely, when killing cattle is a crime, the optimal sanction schedule is given by the rancher's marginal benefit schedule, with \$3 added to each entry. Thus, it ranges from \$13 for the first steer killed up to \$43 for the fourth. Given the farmer's constant marginal benefit of \$15 from preventing crop damage, the farmer, as before, will only commit a single offense, resulting in herd size of three and total enforcement costs of \$3. The net social gain in this case equals \$42 = \$90 − \$45 − \$3. Note that this amount exceeds that in the previous scenario because of the lower enforcement costs in the current scenario (\$3 versus \$9). Thus, assigning legal entitlements so that crop damage is legal and killing cattle is illegal is optimal in this example. The asymmetry here is due to the fact that the optimal herd size of three just happens to be closer to the maximal herd than it is to zero. Thus, fewer "criminal exchanges" are needed to achieve that outcome when the entitlement is assigned to the rancher as opposed to the farmer, and as a result, total enforcement costs are lower.

The preceding example was something of a special case because, given the discrete nature of benefits, the enforcement cost of \$3 was small enough that it did not change the optimal crime rate under either assignment of rights. (This would have been the case for any cost between zero and \$5.) Thus, the level of deterrence remained the same as in the zero-cost case. Suppose instead that the enforcement cost is \$6, which is large enough that it *will* alter the optimal herd size. First, when crop damage is a crime, the optimal fine is \$21 (=\$15+\$6), and so now the rancher will only add two cattle to his herd, resulting in a net social gain of \$28 = \$70 − \$30 − \$12. Conversely, when killing cattle is a crime, the optimal sanction will range from \$16 for the first offense up to \$46 for the fourth. In this case, the farmer will not find it optimal to

kill *any* cattle; that is, complete deterrence is the optimal (second best) solution in this case. The result is a net social gain of \$40 = \$100 − \$60. Thus, it is again optimal not to criminalize crop damage but to criminalize killing cattle. Here, the preference for the latter assignment reflects the combined costs of enforcement and excessive deterrence.

The examples with positive enforcement costs illustrate the general conclusion from above that costly enforcement provides an economic basis for assigning legal entitlements. Specifically, entitlements should be assigned so as to minimize the effects of enforcement costs.[27] In terms of criminal law, this principle represents a morally neutral way of determining what acts should be criminalized because it does not rely on a subjective prioritization of the values of one interest group over another.

Precisely for this reason, I would argue, this approach to lawmaking is particularly relevant when it comes to the problem of legal reform because of the need for the law to recognize and respond to evolving social values. Indeed, one signal of changing values is systematic or open non-compliance with an existing law, as exemplified by acts of civil disobedience, a topic to which I now turn.

4 Law Breaking as a Moral Act: Civil Disobedience

Civil disobedience is a principled act of law-breaking that is aimed at calling attention to an unjust law. Rawls (1971, p. 364) specifically defined it to be

[27] This conclusion obviously echoes corollaries to the Coase Theorem in the presence of positive transaction costs. See, for example, Cooter (1982, p. 14), who notes that when transaction costs are high, "the structure of law should be chosen so that transaction costs are minimized, because this will conserve resources used up by the bargaining process…" Fischel (1985) describes a similar standard for achieving efficient land use in the presence of externalities. He specifically proposes a "normal behavior standard" as the initial entitlement point, such that any landowner who fails to adhere to that standard would be subject to a sanction. This structure is efficient, he argues, because it minimizes the transaction costs of inducing people to conform "to prevailing social standards of acceptable behavior" (p. 159).

> …a public, nonviolent, conscientious yet political act contrary to the law usually done with the aim of bringing about a change in the law or policies of the government. By acting in this way one addresses the sense of justice of the majority of the community and declares that in one's considered opinion the principles of social cooperation among free and equal men are not being respected.

In Rawls's view, civil disobedience is a political act undertaken with the aim of forcing "the majority to consider whether it wishes to…acknowledge the legitimate claims of the minority" (pp 366-367). In this way, it is an important tool of legal reformers seeking to act within the confines of a "nearly just society, one that is well-ordered for the most part but in which some serious violations of justice nevertheless do occur" (p. 363).

The practice has a long history in human civilization,[28] but it was Henry David Thoreau who first brought it to prominence in the American social conscience when he spent a night in jail for refusing to pay taxes to a government that condoned slavery. He went on to write a celebrated essay defending his action, and that manifesto has had an important influence on subsequent generations of reformers, including Susan B. Anthony, Ghandi, and Martin Luther King. In his essay, Thoreau posed the dilemma as follows: "Unjust laws exist: shall we be content to obey them, or shall we endeavor to amend them, and obey them until we have succeeded, or shall we transgress them at once?" (Thoreau, 1965 [1849], p. 644). His answer was to break them at once. Rawls, by contrast, viewed civil disobedience as an option of last resort, to be used only "after the legal means of redress have proved of no avail" (p. 373). (Thoreau, however, probably would not have accepted the premise that the government against which he was protesting was "nearly just.")

[28] An early example is found in Sophocles's play *Antigone*, in which the title character defies an order by King Creon not to bury her dead brother Polynices. She justifies her act of lawbreaking by saying, "For me it was not Zeus who made that order. Nor did that Justice who lives with the gods below mark out such laws to hold among mankind. …So not through fear of any man's proud spirit would I be likely to neglect these laws" (Sophocles, 1976, p. 174).

In any event, the practice has attained a praiseworthy status in civil societies as a legitimate avenue by which a conscientious minority can express its strong disagreement with what it perceives to be an unjust law. As a result, such violations are themselves considered to be moral acts when undertaken out of genuine conviction. But this naturally raises the question of how we can distinguish between true acts of civil disobedience from mere violations based on narrow self-interest—Becker's "efficient crimes." It is precisely because any such effort to distinguish them would only amount to reasserting the question of which gains should count in welfare that economists do not seek to make such a distinction, opting instead to count all benefits and harms.[29] (This is Friedman's (2000) position.) One may quibble about how to attach a dollar measure to certain intangible values, but the measurement problem is not itself a good reason to exclude certain harms or benefits from welfare. It does not, for example, prevent the value of a human life, or of various environmental resources, from being considered in policy debates.

In terms of the straying cattle example, no matter which assignment of entitlements is put in place, those who embrace the moral theory of criminal law would exclude the gains from violating that assignment from social welfare. Thus, when crop damage is a crime, the value of foregone cattle would not be counted in welfare, and when killing cattle is a crime, crop damage would not be counted. For the moral theorist, making such a choice is necessary because there is no neutral point; given the inherent incompatibility of the two activities, privileging one side

[29] Calabresi and Melamed (1972, footnote 30) raise the complicating possibility that favoring one side in a dispute will have spillover effects on any third parties who deem one assignment of rights worthier of legal protection than the other on moral grounds. They refer to such external effects as "moralisms," which will be pervasive in the context of acts traditionally labeled as crimes precisely because of the moral basis of criminal law. As morals evolve, however, so presumably will the side on which these moralisms tend to lie.

must necessarily harm the other. Efficiency, on the other hand, provides a neutral means of balancing the competing interests in such cases.

Critics of the economic approach, in suggesting morality as a superior basis for favoring one activity over another, offer no guidance as to how the competing values should be weighed, and, apropos of the current discussion, under what circumstances (if any) these priorities can be adjusted or reformed. In particular, there appears to be no room in this view for Thoreau's contention that a truly moral course of action is sometimes to transgress unjust laws at once. Under the economic theory, by contrast, rational non-compliance with the law, *for whatever reason*, is seen as a legitimate act (i.e., an efficient crime), provided one is willing to pay the price. Further, as suggested above, systematic disobedience of a particular law can be an important signal that social values are evolving with respect to that issue, and that legal reform may be warranted.[30] Repeal of Jim Crow laws during the Civil Rights era, and the decriminalization of medicinal or recreational use of certain drugs in more recent times, are examples of this evolutionary process. This perspective on legal reform, however, only makes sense if offenders' gains are counted as socially relevant.

The point here is not that there is no place for morality in law. Indeed, as was suggested above, there is little dispute that morality is the origin and basis of much of the criminal law. But appealing to morality as a reason for excluding competing values from the determination of what acts are or are not socially acceptable is a different question. The economic approach to lawmaking does not necessitate the abandonment of moral values; to the contrary, it urges inclusion of competing values without judgment about which deserve to be counted in social

[30] See, for example, the analysis of Glaeser and Sunstein (2015).

welfare (notwithstanding measurement problems). That viewpoint would itself seem to constitute a moral value.

5 Concluding Remarks

The debate about whether criminal gains should be counted in social welfare really amounts to asking whether those harmful acts that are labeled as crimes are fundamentally different from "mere externalities." The urge of most economists is to say that they are not, and that they can and should be treated within a common theoretical framework. And in fact, that has become the orthodoxy following Becker's original formulation of the economic model of crime and punishment more than a half century ago. However, because that model has focused on optimal enforcement of law, while taking as given the set of acts that are considered illegal, the debate about offenders' gains has principally centered on how much should be spent on enforcement. This paper has extended that debate to the prior question of what acts should be considered crimes.

The chief alternative to the economic theory of crime is one based on morality. And if there were general agreement about what acts are morally unacceptable, then an economic analysis of crime would appropriately be limited to prescribing the least-cost way of enforcing the law, and any debate about offenders' gains would only involve quantitative effects (i.e., how much to spend). But moral views are themselves subject to debate because they often reflect conflicting interests or views. In that light, an economic perspective on what acts should be considered crimes is legitimate precisely because it offers a morally neutral way of arbitrating among these competing interests. From that perspective, it is natural—indeed essential—to count offenders' gains because the very identity of an "offender" is dependent upon the initial

delineation of legal rights. This idea becomes especially evident in discussions of legal reform, which necessarily depend upon a comparative assessment of conflicting values.

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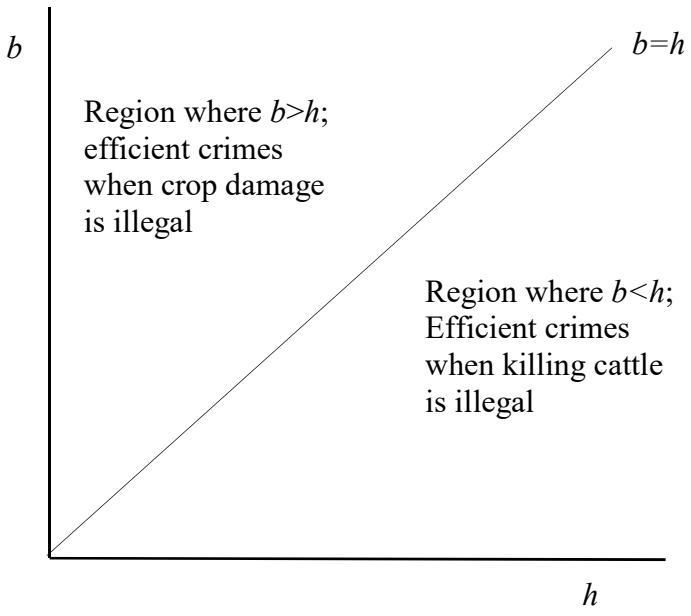

Figure 1. Net gain with costless and efficient law enforcement.

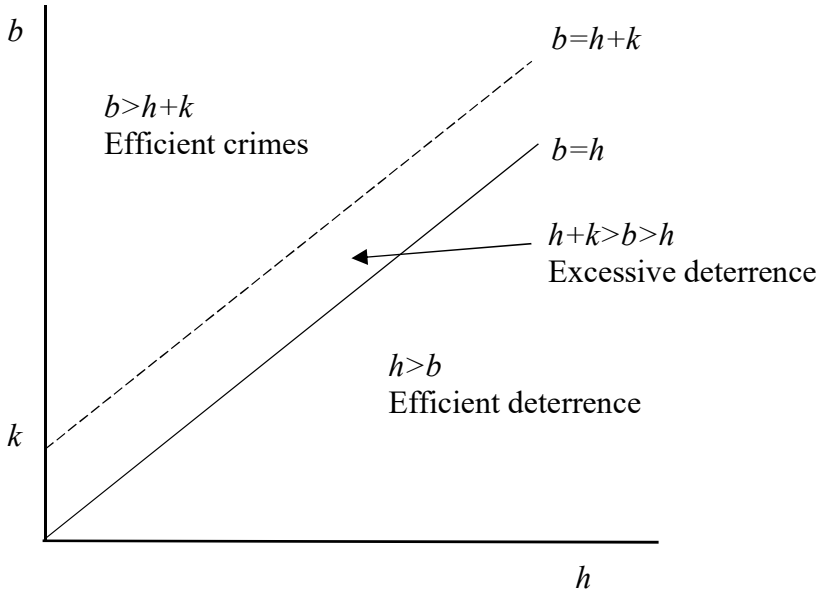

Figure 2. The situation when crop damage is a crime and enforcement is costly.

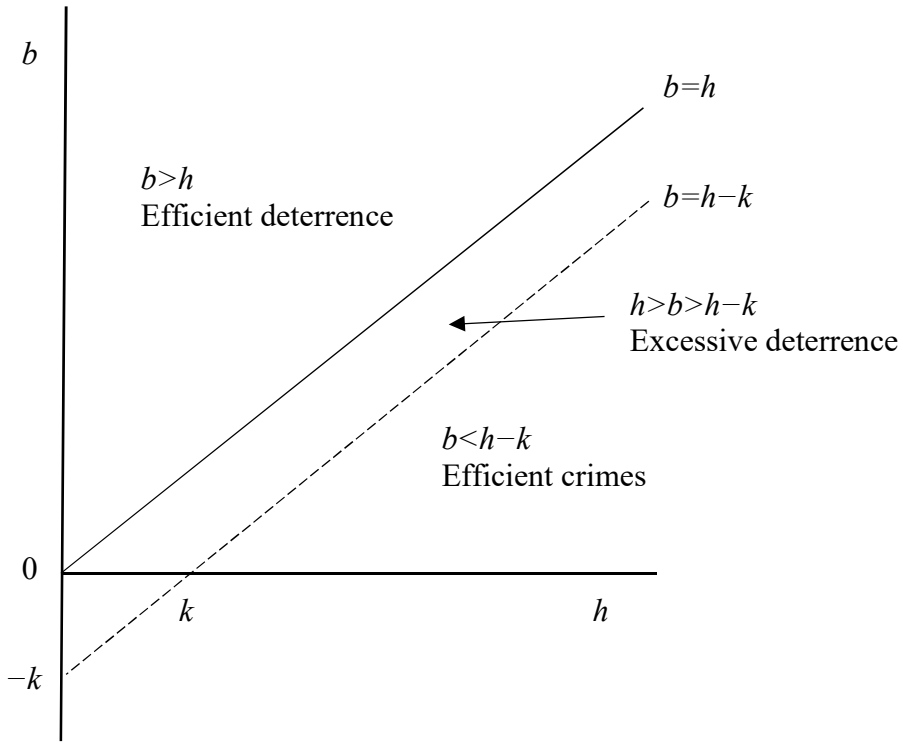

Figure 3. The situation when killing cattle is a crime and enforcement is costly.