What You Don't See Can't Hurt You: An Economic Analysis of Morality Laws*

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Abstract

This paper provides an efficiency explanation for laws regulating sex, drugs and gambling. The argument is motivated by the observation that the design of these laws often promotes discretion by the people engaging in such activities. We propose that morality laws can be best explained by considering the proscribed activities to impose a negative externality on others *when the activity is observed.* In such a case, efficiency requires discretion on behalf of the individual who engages in such activities. Since discretion is often difficult to regulate, the activities are instead proscribed thereby giving individuals incentive to hide their actions from others. In addition, since some level of activity is efficient, the optimal sanctions are not maximal.

Key Words: Crime; Externality; Laws; Morality; Enforcement

JEL: K42; K32; H32

"What, then, is the rightful limit to the sovereignty of the individual over himself? Where does the authority of society begin? How much of human life should be assigned to individuality, and how much to society?"

– J.S. Mill, "On Liberty", Chapter 4

1 Introduction

There are parts of each of our lives that we view as private. Other aspects of our lives we view as public and subject to pressures of social responsibility and possibly regulation. The distinction between private and public life plays a central role in many political and philosophical debates. One point of view, often referred to as 'liberalism", maintains that it is important for certain decisions that the individual remain sovereign, i.e. that it belong to the private sphere. An example of this view is presented in former Canadian Prime Minister Pierre Elliott Trudeau's famous quote that "the state has no business in the bedrooms of the nation". While Trudeau meant "in the bedrooms" in a figurative sense to indicate that he was talking about sexual regulation, it was also meant in a very literal sense. A common formulation of the libertarian view is that what consenting adults do *in the privacy of their own home* is nobody's business but their own. That is, the decisions that are deemed to be private, i.e where the decision maker is sovereign, are often restricted to take place in a location that is physically private. This paper proposes that the linkage between private decisions and private locations is evident in many social norms and regulations and that it stems from the presence of negative externalities that are incurred *when the activity is observed.*

The idea that the observation of an activity could affect one's utility is sometimes referred to a "psychic" externality. In contrast, a "real" externality would be one that has measurable physical effects, such as the destruction of physical property or an increase in productivity. The distinction between real and psychic externalities can be subtle. An aim of this paper is to emphasize that the distinction based on the observability of the action can be quite powerful in explaining various institutions. If a river is polluted, the harm is felt even if the identity of the polluter is not known. As

such, hiding on behalf of the polluter merely decreases the probability of detection and being fined. The resources spent on hiding are thus not productive, they are being used solely for rent-seeking. With psychic externalities, however, the harm (or benefit) can be reduced if the activity is not observed. For example, foul language is offensive to some. However, 'bleeping out' offensive words on television, for example, can reduce the externality, even though it is clear what words were actually said. As a result, it can be efficient to incur costs in order to make one's actions less conspicuous.

This paper is not the first to propose that psychic externalities can be important in explaining customs and regulations. With respect to morality laws, Rasmusen (1997) argues that the law need not differentiate between real and psychic externalities. For example, if person A is willing to pay person B to stop using drugs, and willing to pay more than B needs to be willing to stop, then efficiency requires that B stop using drugs. However, transaction costs might prevent the gains from trade from being exploited, and so regulation should be passed. This is true whether the A's willingness to pay stems from a real or psychic externality. The problem becomes more complex, however, if we consider the psychic externality to be influenced by the observability of the action. Consider an example in which A is willing to pay B to not do drugs in A's sight. Suppose A is willing to pay $100 for B to stop using drugs altogether and $40 for B to stop using drugs in A's presence. If B needs at least $120 to be compensated for not doing drugs, and $30 to do drugs away from A, then efficiency requires that B do drugs, but only out of A's sight. Legislation that allows B to do drugs only in private can often be difficult to enforce, however. This paper demonstrates that the first-best (i.e. efficient consumption and hiding) can be implemented even when it is impossible to legislate on discretion. Specifically, legislators can provide incentive for B to consume drugs discreetly by making drug use illegal but with a low penalty. Using the above example, as long as detection by the authorities is correlated with observation by others, B will be deterred from using drugs in public, where the probability of getting caught is relatively high, but not from doing them in private, which is efficient.

We construct a model in which an agent, called the injurer, chooses the level of consumption for a good which causes harm to another agent, called the victim. This harm is assumed to be reduced by costly hiding behaviors. In the absence of

legislation, the injurer will not choose to hide and, further, will choose to consume until the marginal benefit equals the private marginal cost, leading to too little hiding and consumption greater than the socially efficient level. The government is assumed to have two instruments with which it can affect the injurer's consumption. First, it can choose a penalty, or sanction, for consuming the banned good. This sanction can be a function of the amount consumed and need not be linear. Second, it chooses a level of effort in enforcing the quota, which affects the probability that the injurer is caught when consuming a proscribed level. However, this probability can also be affected by the injurer. The hiding that reduces the harm to the victim is also assumed to reduce the probability of detection. It need not be the case that hiding be equally as effective at reducing the probability of being caught as at reducing the harm to the victim.

As noted above, when externalities are real, hiding on behalf of criminals is a socially wasteful allocation of resources. Malik (1990) shows that when criminals can invest effort in hiding their crimes, maximal sanctions may be sub-optimal even when sanctions are costless. Higher sanctions increase the incentive to hide, which is welfare reducing. When externalities are psychic, however, some amount of hiding is welfare enhancing. If hiding behavior cannot be legislated directly, an injurer will choose to hide her consumption only if it is illegal. As a result, the government will choose to ban the good, even though the efficient level of consumption is positive, but choose sanctions and enforcement such that the injurer will choose to consume and engage in socially beneficial hiding. It should be noted that this implies that optimal fines are not maximal and that a certain level of crime is socially desirable.

Legislation surrounding drug use has received some attention from economists. Becker, Grossman and Murphy (2003) consider the positive and normative effects of legislation against drugs. Their positive analysis draws from the work of Malik (1990) by considering costly avoidance behavior on behalf of drug producers. For their normative analysis, they consider a social planner that does not value drug consumption purely according to the utility of the agents in society. In particular, the planner may value utility derived from drug consumption less than other forms of utility. This paper offers an model in which the social planner maximizes the sum of agents' utilities and yet wishes to regulate drug use. Boylan (2004) considers the

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political economy of drug legislation. He notes that drug offenses are over-represented among federal prosecutions. The explanation offered is that drug use imposes a negative externality at a national level. As such, states do not take into consideration the full effect of drug use within their borders and so do not deter it sufficiently. As a result, prosecution at a federal level is welfare improving. For Boylan, it does not matter whether the externality is real or psychic. However, the next section demonstrates that there exist certain stylized facts about morality laws which can only be explained when one recognizes the efficiency of discretion.

1.1 Stylized Facts about Morality Laws

A particular focus of this paper is the explanation of morality laws. Morality laws include prohibitions against exchanging sexual favors for money, gambling and the use of narcotics. Such prohibitions have long presented a puzzle for economists. As noted by Posner (1992), arguments in favor of these laws often claim that such activities can have deleterious effects for not only the individual committing the act(s) in questions, but also others. Economists tend not to be concerned with the harmful effects of drug use, for example, on the user. The presence of an externality, however, could certainly allow for legislation. Indeed, examples of real externalities have been put forward in order to explain these laws: prostitution leads to increased spread of sexually transmitted disease; drug use leads to an increase in accidents and crime. As noted above, Rasmusen (1997) proposes that psychic externalities should be viewed as identical to real externalities. In this section, we examine some stylized facts about morality laws in order to demonstrate that the efficiency of discretion is important in understanding these laws.

As mentioned above, if hiding is efficient, then there should exist a body of legislation that makes only the public aspect of an activity illegal. Indeed, there exist many such laws. Alcohol is legal in all common law countries, but is subject to many restrictions. While these restrictions vary somewhat from country to country, they all[1] entail keeping consumption of alcohol to specific areas and preventing public

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[1] The analysis of this paper is restricted to the common law tradition. There are, of course, many countries that do not follow the common law tradition that ban alcohol entirely.

drunkenness. Both Canada and the UK have less regulation on sexual activity than the US, although the regulation that does exist is clearly designed to keep the activity discreet. Prostitution is legal in both Canada and the UK, but solicitation is not. In other words, it is legal to exchange money for sexual favors in both of these countries, it is just not legal to discuss it in public[2]. In addition, brothels, or "bawdy houses", are illegal. As such, anyone wishing to engage in prostitution must do so discreetly. Anal intercourse is also subject to regulation in Canada. The Canadian Criminal Code allows for anal intercourse only in private, where "private" is defined as follows: "an act shall be deemed not to have been engaged in in private if it is engaged in in a public place or if more than two persons take part or are present". Other forms of legislation that promote discretion include laws in North Carolina that require that the shades to all windows be pulled while engaging in the sex act. In Wisconsin, condoms must be kept behind the pharmacist's counter; they may not be displayed. Such legislation seems clearly targeted at promoting discretion in those who engage in the activities in question.

As mentioned above, activities such as drug use and prostitution may impose real externalities on others. While we would not dispute the existence of such externalities, the regulations described above sometimes do little to reduce any real externalities and may in fact exacerbate them. Consider the argument that sexually activity should be regulated to decrease the spread of sexually transmitted diseases. Wisconsin's law that requires condoms to be kept hidden from view would seem counterproductive in this regard. It would make purchasing condoms more embarrassing, thereby leading to *more* unprotected sex. Making prostitution illegal reduces the demand for prostitutes. This leads to a reduction in the spread of venereal disease, holding safe sex practices constant. However, driving prostitution underground may have the effect of increasing the practice of unsafe sex, by reducing the prostitute's

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[2]The Canadian Criminal Code states that "every person who in a public place or in any place open to public view (a) stops or attempts to stop any motor vehicle, (b) impedes the free flow of pedestrian or vehicular traffic or ingress to or egress from premises adjacent to that place, or (c) stops or attempts to stop any person or in any manner communicates or attempts to communicate with any person for the purpose of engaging in prostitution or of obtaining the sexual services of a prostitute is guilty of an offense punishable on summary conviction". It should further be noted that this can be (and is) applied to both prostitutes and their customers.

ability to require that her customers wear condoms, or by making regular checkups more costly, leading to a net *increase* in sexually transmitted diseases. In general, it seems unlikely that banning prostitution would be more effective at reducing STDs than legalizing it and imposing regulations surrounding the practice of safe sex. Posner (1992) notes that the arguments for laws against drugs based on real externalities are often unconvincing. He argues that the fact that drug use leads to crime is primarily due to the monopoly pricing of drugs that stems from the illegality of the drugs. That is, since drugs are illegal, the price of drugs is inflated beyond the level that users can afford without resorting to crime. Legalizing drugs would lead to increased competition in production, leading to lower prices, and less crime. While this view may be controversial, it should be noted that the argument of real externalities does seem incomplete when trying to explain the differences between legal restrictions on alcohol and marijuana.

Finally, recall that psychic externalities may be such that the first-best entails positive consumption and hiding. In this case, the laws should entail small penalties in order to promote discretion without deterring the activity altogether. This seems to be the case. An estimated 5.7 million Americans were cocaine users in 2000[3]. In 1990, Americans consumed $69.9 billion (US), or 447 metric tons worth of cocaine[4]. The Alcohol and Other Drugs Survey of 1994 found that 23% of Canadians had tried marijuana at least once[5] and that there were an estimated 14 million *current* users of marijuana in 2000[6]. Easton (2004) estimates that there may be as many as 17,500 "grow-ops" currently in British Columbia. Easton also notes that penalties for running a grow-op are very low. In Vancouver, 55% of grow-op "busts" led to no jail time and only 13% received jail time greater than 90 days. Further, only 35% of cases led to a fine, and the average fine meted out was a paltry C$1,200. Penalties do not appear to escalate significantly for repeat offenders. In the United States, the National Task Force on Prostitution estimates that in the 1980s over 1 million

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[3]Taken from the Office of National Drug Control Policy webpage, http://www.whitehousedrugpolicy.gov/publications/factsht/cocaine/index.html.

[4]Taken from the Office of National Drug Control Policy webpage, http://www.whitehousedrugpolicy.gov/publications/factsht/cocaine/index.html.

[5]Taken from Canada's 2002 Report of Senate Special Committee on Illegal Drugs (p.91).

[6]ibid (p.101).

people and 1% of American women have been employed as prostitutes[7]. Finally, during prohibition in the US, sanctions were relatively small. As pointed out by Levitt (2003) and MacCoun and Reuter (2001), the average punishment was 35 days and a $100 fine. While precious few, if any, crimes are deterred completely, it does seem that these activities could be deterred to a greater degree.

The reasons that an individual may prefer that activities such as drug use and prostitution be done out of sight are not explicitly considered in this model. In general, it seems plausible that the visibility of the activity may be unpleasant in and of itself (i.e. be a purely psychic externality), or it may lead to harm of a real nature. In particular, it seems quite probable that a large source of harm that stems from the visibility of drug and alcohol use stems from the impact on children. Exposing children to alcohol and drug abuse at a young age may have severe consequences for later life, and so be very important in determining legislation. The model developed in this paper is consistent with the idea that visibility of an activity causes real harm, but will typically refer to such an externality as psychic. The following section outlines the model and the results. Section 3 concludes and discusses some issues not addressed by the model. All proofs are in the appendix.

2 The Model

2.1 The Environment

We consider a simple economy with two agents and a government. The first agent, who we call the injurer, I, derives utility from the consumption of a single good or activity. Denote the injurer's consumption by θ, and let $B(\theta)$ be the benefit derived from consumption, where $B(\cdot)$ is continuous and differentiable and $B'(\cdot) > 0$. The injurer can also choose to hide her consumption. Let h denote the level of hiding, which has a per-unit cost of 1 so that the injurer's utility from consumption θ and hiding h is given by $U^I(\theta, h) = B(\theta) - h$. The second agent we call the victim, V. The victim suffers some disutility from the injurer's consumption. This disutility is

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[7]Taken from Prostitutes' Education Network, http://www.bayswan.org/stats.html.

reduced by the injurer's hiding. Denote the harm incurred by the continuous and differentiable function $C(\theta, h)$, where $C_\theta(\cdot) > 0$ and $C_h(\cdot) \leq 0$. Note that the victim does not make any decisions in this simple model. It is assumed that transaction costs are such that bargaining cannot take place.

The interpretation that θ represents consumption and h hiding has been chosen to emphasize the application to morality laws. In this case, θ simply represents, for example, the amount of drugs consumed in a given time period, while h represents the costs incurred to ensure that V does not see I's consumption. These costs may be monetary, such as the purchase of an air filter so that V does not smell marijuana smoke, or they may represent the loss of utility associated with not being able to consume the drugs wherever and whenever I would like. It should be noted that θ and h can also be interpreted in a way that allows for the analysis of politeness norms. For example, θ could be interpreted as the extent to which one speaks one's mind, and h could be the costs of ensuring that one does not use language that others find offensive.

2.2 Efficiency

In the absence of transaction costs, the injurer and victim would be able to bargain so that the injurer's consumption and hiding maximize the sum of the injurer's and the victim's utilities. That is, the efficient levels of consumption and hiding, denoted by θ^o and h^o respectively, solve the following problem:

$$\max_{\theta, h} B(\theta) - C(\theta, h) - h$$

Suppose that a solution exists, i.e. that the first-best levels of consumption and hiding are finite. Denote these efficient levels by θ^o and h^o, respectively. If both θ^o and h^o are positive, then the social optimum is characterized by the system of equations

$$B'(\theta^o) = C_\theta(\theta^o, h^o) \tag{2.1}$$

$$-C_h(\theta^o, h^o) = 1 \tag{2.2}$$

Figure 1 depicts the efficient levels of consumption and hiding. It should be noted that it is possible for the efficient level of hiding to be zero. For example, this occurs when hiding does not affect the harm incurred by victim. Such cases correspond to the traditional environment of externalities and regulation. In addition, if the first-best level of consumption is zero, then the traditional analysis of crime applies.
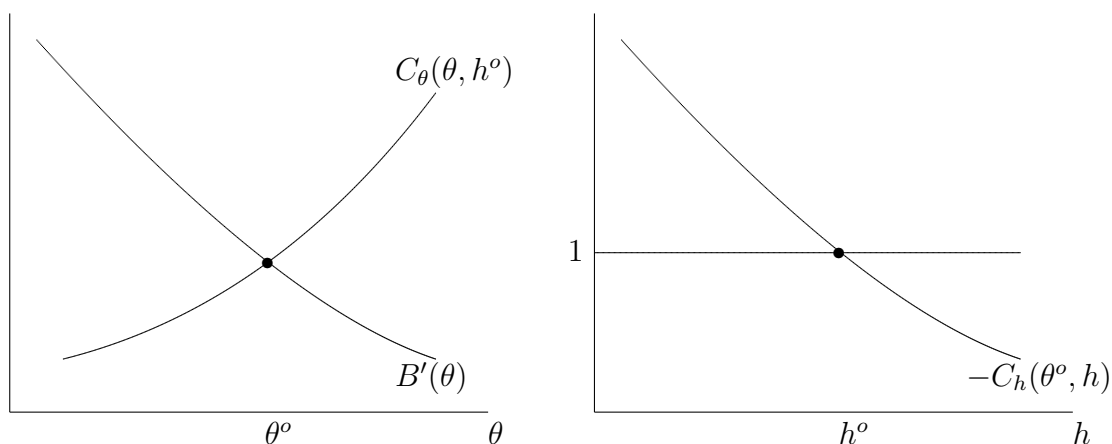

Figure 1: On the left, the marginal benefit of consumption is equal to the marginal cost, given the efficient level of hiding. On the right, the marginal benefit of hiding, given the efficient level of consumption, is equal to the per unit cost of one.

When transaction costs are present, institutions generally arise in order promote efficiency. That is, people generally develop customs based on the efficient behaviors and some of these customs are backed by the code of law. While the following analysis is considers the promotion of efficiency by the courts, the same analysis applies to social norms. With a social norm, there exists an level of consumption of hiding that is deemed socially acceptable, and deviations from the norm would be punished in a repeated interaction setting. Examples include norms about suitable language and topics of conversation. There are many ways to express an opinion. The fact that some language is considered not socially acceptable means that people must incur some cognition costs to ensure that they do not use the offending language in certain situations. Some societies have norms that restrict "polite society" from discussing topics such as politics and religion. Clearly the norm does not intend to discourage

conversation on these topics altogether, but since these topics can be emotionally charged, the norm ensures that such conversations take place only when all parties are willing to engage in them.

The following section considers how a central planner could promote efficiency when it has the instruments of the courts available to it.

2.3   The Government's Problem

The government is assumed to maximize the sum of agents' utilities derived from the injurer's consumption less enforcement costs. It should be noted that the set of instruments available to the government could vary depending on the particular good or activity being regulated. In particular, the government may or may not be able to regulate hiding behavior directly. If the government is able to regulate hiding, then the optimal policy would be to set a quota equal to θ^o and to require that the injurer choose h^o. This would be accompanied by minimal enforcement and penalties for deviating from θ^o and h^o sufficiently high to ensure that the injurer complies. As noted above, examples of such regulation on hiding behavior can be readily found.

Regulation on hiding behavior may not always be possible, however. Furthermore, quotas on consumption may also be difficult to enforce. In this case, the government is limited to choosing enforcement, the penalty and amount of monitoring, for consumption only. If the injurer decides to consume the good, she will be fined with some probability. The probability that illegal consumption is detected is given by $p(e, h)$, where e is the enforcement effort chosen by the government. The larger the effort by the government, the larger is the probability of being detected, $p_e(\cdot) > 0$. The cost of enforcement effort is given by $\kappa(e)$ where $\kappa'(e) > 0$ and $\kappa''(e) \geq 0$. It is also assumed that $\kappa'(0) = 0$. The injurer's hiding behavior decreases the probability of being caught, $p_h(\cdot) < 0$. Finally, we assume that there exists a small chance that the injurer will get caught even if the government does not expend any enforcement effort. That is, we assume $p(0, h) > 0$, $\forall h$[8].

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[8]This assumption is made purely to simplify the analysis. Without this assumption, attention would be restricted to suprema of the government's objective function as opposed to maxima.

An injurer who gets caught consuming the banned good, receives a sanction $S(\theta)$. The sanction is increasing in consumption. As will be seen below, the rate of increase of the sanction, $S'(\cdot)$ is also important. It is assumed that these sanctions can be collected without cost. As such, any sanction levied acts as a transfer between individuals and does not appear in the government's objective function. The government's maximization problem is given by

$$\max_{e, S(\theta)} B(\theta) - C(\theta, h) - h - \kappa(e)$$

As is indicated above, the injurer's behavior will depend on the government's choice of policy, $(e, S(\theta))$. In order to examine the government's optimal policy, it is necessary to examine how the injurer's decisions of θ and h depend on $(e, S(\theta))$. The following section examines the behavior of the injurer.

2.4 The Injurer's Behavior

Given a governmental policy, $(e, S(\theta))$, the injurer can decide to commit crime (choose $\theta > 0$), or comply with the law. If the injurer does not consume the good, her utility is given by

$$U^I = B(0) - h$$

If the injurer chooses to consume the good, then her (expected) utility is given by

$$U^I = B(\theta) - p(e, h)S(\theta) - h$$

First, note that when the injurer complies with the law, her utility is strictly decreasing in h. Thus one possible solution to the injurer's maximization problem is given by $\theta = 0$ and $h = 0$. We shall refer to this solution as compliance. Another possible solution is for the injurer to choose $\theta > 0$. In this case, the optimal choices for θ and h are characterized by the following first order conditions:

$$B'(\theta^*) = p(e, h^*) S'(\theta^*) \tag{2.3}$$

$$-p_h(e, h^*) S(\theta^*) = 1 \tag{2.4}$$

Equation 2.3 states that when the injurer chooses her level of consumption, she equalizes the marginal benefit of consumption with its marginal cost, which is given by the probability of being detected times the marginal sanction. Simultaneously, the injurer chooses the level of hiding to equalize the marginal reduction in the expected sanction, with its marginal cost of one.[9] We assume that the solution to equations 2.3 and 2.4 is unique for every policy $(e, S(\theta))$. Let θ^* and h^* denote this solution, depicted in Figure 2. For simplicity, it is assumed that in the case that the injurer is indifferent between committing crime and complying $(B(\theta^*) - p(e, h^*) S(\theta^*) - h^* = B(0))$, the injurer chooses to commit crime.
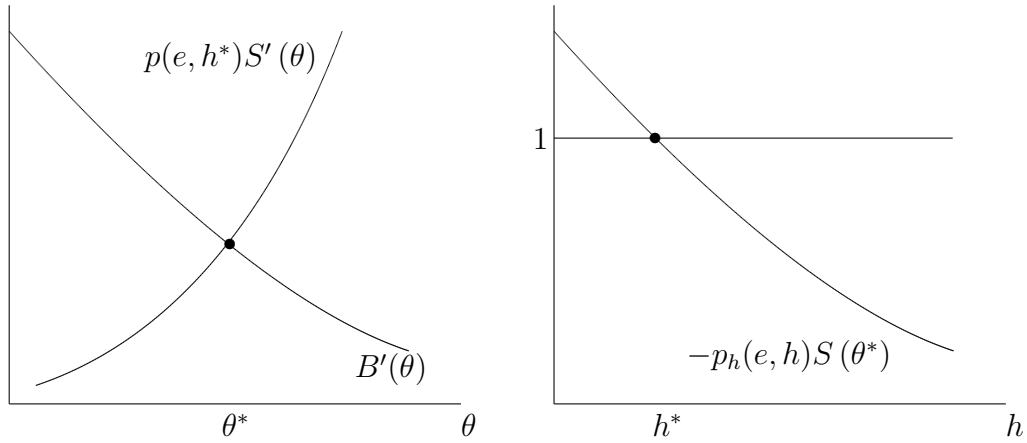

Figure 2: On the left, we show the injurer's optimal choice of consumption, given h^*. On the right, we show the injurer's optimal choice of hiding, given θ^*.

We now consider the government's optimal policy, given the injurer's behavior as described above.

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[9]The second order conditions will be satisfied as long as $B''(\theta^*) - p(e, h^*) S''(\theta) < 0$, $-p_{hh}(\cdot) < 0$ and $-[B''(\theta^*) - p(e, h^*) S''(\theta^*)] p_{hh}(e, h^*) S(\theta^*) - [p_h(e, h^*) S'(\theta^*)]^2 > 0$, which we will assume to be the case. It should be noted that the assumption that $-p_{hh}(\cdot) < 0$ is an innocuous one. Since the probability of being caught cannot go below zero, it must be that for every e, there exists an $\bar{h}$ such that $p_{hh}(\cdot) > 0, \forall h > \bar{h}$. That is, hiding eventually has decreasing returns with respect to its effect on the probability of being caught.

2.5 Optimal Policy

It may seem at first that the government has as many instruments as the injurer has choice variables (two), and that one of these instruments, monitoring effort, is costly. In general, the government is not able to implement the first best in such situations. However, the sanction affects the injurer's behavior both through the level, $S(\theta)$, and the rate of increase, $S'(\theta)$. Thus the government actually has three instruments available to it, one of which is costly. As such, the first best is in fact implementable without cost. The government should choose monitoring to be equal to zero, so that no costs are incurred, the level of the sanction should be chosen so that the marginal benefit to hiding is equal to its marginal cost of one, and the rate of increase of the sanction should be chosen so that the marginal benefit of consumption is equal to the marginal expected penalty. The only condition that may prevent the first best from being implemented is that the level of the sanction must be such that the injurer chooses to commit crime as opposed to complying. This participation constraint is met as long as hiding is effective enough at reducing the probability of being caught, the first best is achievable. This is demonstrated formally in the following theorem.

Result 1: *If the government chooses $e = 0$, $S(\theta^o) = \frac{1}{-p_h(0,h^o)}$ and $S'(\theta^o) = \frac{B'(\theta^o)}{p(0,h^o)}$, the first best is implementable if and only if $\epsilon_{ph}(0,h^o) \geq \frac{h^o}{B(\theta^o)-B(0)}$, where $\epsilon_{ph}(0,h^o) = -\frac{h^o p_h(0,h^o)}{p(0,h^o)}$.*

Figure 3 depicts the implementation of the first best. The government uses $S(\theta)$ and $S'(\theta)$ to emulate the marginal social costs at the efficient levels of consumption and hiding. This leads the injurer to internalize the costs imposed on the victim. Specifically, $S'(\theta)$ is set such that the marginal expected penalty to illegal consumption is equal to the marginal cost to the victim at the efficient level. At the same time, $S(\theta)$ is set so that the marginal benefit of hiding to the injurer is equal to the marginal benefit of hiding to the victim, again at the efficient level.

Note that sanctions that increase at an increasing rate, $S''(\theta)$, help ensure that the injurer's second order conditions will be satisfied. This is consistent with penalties for possession of large amounts of drugs being significantly higher than for small amounts, and with penalties that are increasing for repeat offenders. It should further be noted that, as long as the participation constraint is satisfied ($S(\theta^*)$ is such that the injurer
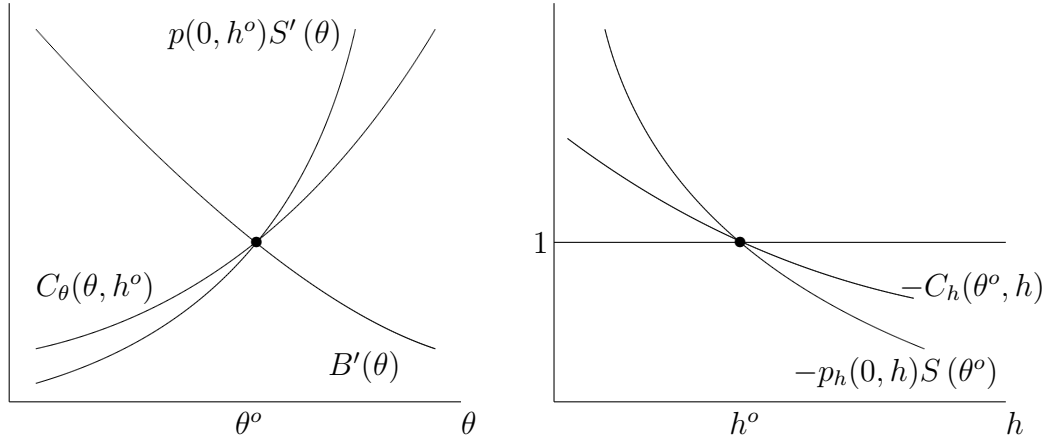
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Figure 3: On the left, the injurer chooses the efficient level of consumption, given h^o. On the right, the injurer chooses the efficient level of hiding, given θ^o.

chooses to commit crime), it is always possible to come up with a sanction schedule such that $S''(\theta^*) > 0$.

A corollary to this theorem is that the optimal sanction is not maximal. Since the solution involves the injurer choosing to commit crime, the sanction $S(\theta^o)$ has to be set to a finite value even though it is costless. This provides another example of the non-optimality of maximal sanctions to complement the results of Andreoni (1991), Kaplow (1990), Malik (1990), Polinsky and Shavell (1984) and Shavell (1991). Also of interest is the fact that efficiency requires crime to be committed even though it is costless to deter it. To our knowledge, this paper provides the first example of such a result.

Now suppose that the participation constraint is binding. That is suppose that the sanction that would induce the injurer to consume the efficient level is such that $B(0) > B(\theta^o) - p(0, h^o) S(\theta^o)$. In this case, the government must drop the sanction so that the injurer will choose to commit crime. If the sanction schedule, $S(\theta)$, simply shifts down (i.e. a new schedule $S_1(\theta) = S(\theta) - \alpha$ is used), the effect will be to reduce the level of hiding since the marginal benefit to hiding decreases. Further, because consumption and hiding are complements, this leads to a decrease in consumption. Note that the reduction in the sanction does not affect consumption directly because

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consumption is determined by the *marginal* sanction. The effect on consumption is purely second order stemming from the complementarity between consumption and hiding.
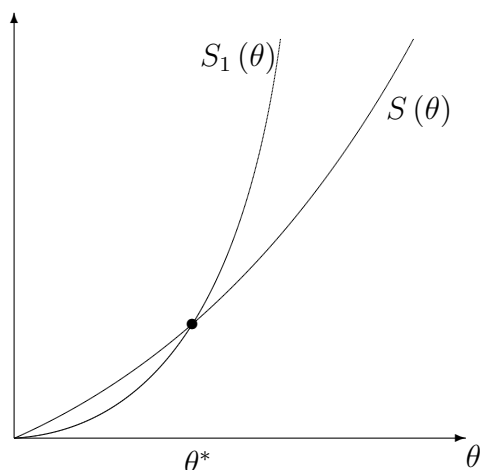

Figure 4: Sanction schedule $S_1(\theta)$ yields the same penalty as schedule $S(\theta)$ at θ^*, but has a higher marginal penalty.

The marginal sanction is something that the government can change, even without affecting the level of the sanction. Figure 4 depicts how the government can increase the marginal sanction at a point, θ^*, without increasing the level. As the marginal sanction increases, the marginal cost of consumption increases. Again, since consumption and hiding are complements, this leads to a decrease in both. So, if the government must lower the level of the sanction, leading to a decrease in hiding and consumption, a decrease in the marginal sanction will counteract that effect, causing both consumption and hiding to go back up. The government will thus choose the level of the sanction such that the injurer is indifferent between complying with the law and committing crime (and therefore commits crime), and sets the marginal sanction so that the social costs of inefficient consumption are traded off with the social costs of inefficient hiding. Note that since the decrease in the level of the sanction causes consumption to decrease through second order effects, and the decrease in the marginal sanction causes consumption to increase as a first order effect, the second best entails the social costs of too much consumption and too little hiding. Figure 5
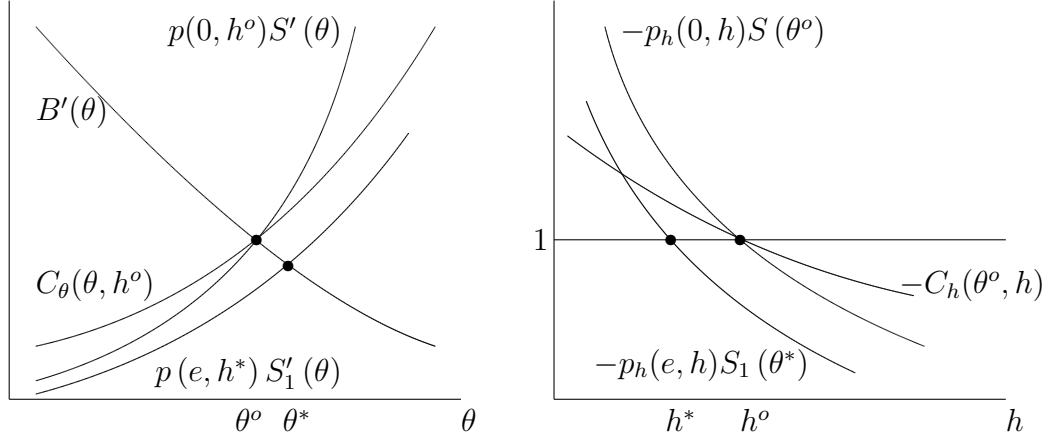
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depicts the second best.

Figure 5: When $S(\theta^o)$ is such that the injurer chooses not to commit crime, the government must lower the sanction and the marginal sanction. On the left, the marginal sanction is lowered from $S'(\theta)$ to $S'_1(\theta)$ and the injurer chooses $\theta^* > \theta^o$. On the right the level of the sanction is lowered from $S(\theta) \, to S_1(\theta)$ and the injurer chooses $h^* < h^o$.

In addition, the government may wish to use monitoring in the second best. Since the second best is characterized by too little hiding, the government will wish to use monitoring when it increases the marginal effectiveness of hiding. The following result formalizes the above intuitions.

Result 2: *When the participation constraint is not satisfied, the government changes the sanction schedule by shifting it down and flattening it. In the second best, there exists too much consumption and too little hiding. Monitoring is used in the second best if and only if monitoring increases the marginal effectiveness of hiding. That is, monitoring is used if and only if $p_{he}(\cdot) < 0$.*

It should be noted that the above model does not consider differential enforcement of the law. That is, the above model assumes no discretion on behalf of authorities when it comes to making arrests or where to monitor. If police have such discretion, then this model suggests that police would enforce the law in such a way as to keep the activity less conspicuous in parts in which there are relatively more people that

are offended, or "injured", by the activity. In particular, the police might allow these activities to take place as long as there are no complaints. This also suggests that, when it is possible to regulate hiding behavior directly, this legislation would often take things like location into consideration. For example, the activity could be legal with a license, but licenses are restricted to certain parts of town.

3   Conclusion and Further Issues

This paper demonstrates that the existing body of laws surrounding sex, drugs and gambling can be efficiency promoting. As noted by Rasmusen (1997), if these activities impose a negative externality on others, then there exists the potential for welfare improvements through regulation. This paper demonstrates that if this externality is diminished through costly hiding on behalf of the injurer, then the socially optimal legislation closely resembles what we observe. In particular, we observe a large body of legislation directed at the public aspect of these activities. Further, legislation that is directly aimed at the activity in question often does poorly at reducing any real externalities. In addition, we regularly observe a combination of penalty and enforcement that leads to low deterrence. Finally, we observe that the enforcement of such activities often depends on the conspicuousness of the activity and the number of people in the area that might be bothered by it. For example, police often do not make any attempts to shut down brothels or grow-ops until they receive a sufficient number of complaints from people in the area.

With respect to this final observation, recall that this model did not allow for any decisions to be made by victims. If there exist parts of a city in which activities such as prostitution or drug use are permitted, then efficiency also requires effort on behalf on the victim to avoid such areas. This would explain why, for example, pay-per-view channels that show explicit adult films are not part of regular cable packages and why they have been allowed to persist. The logic here, as is commonly used by regulators such as the Canadian Radio and Telecommunications Commission, if you don't like it, then don't order it.

Finally, it should be emphasized that this paper is meant to offer positive analy-

sis, not normative. If the promotion of efficiency is indeed desirable in these circumstances, it is worth differentiating between long-run efficiency and short-run efficiency. Consider racist preferences such that the victim incurs psychic harm by seeing minorities. In the short-run, these psychic utility costs may well be increasing in the amount of observation and at an increasing rate. However, many ad campaigns directed at tolerance to minorities suggest that in the long-run, these costs disappear. Thus long-run efficiency would dictate that the victim be exposed to minorities as often as possible. In other words, the analysis of this paper assumed that efficiency required a trade-off between the injurer's and the victim's well-being. If people do get used to observing an activity, such as prostitution, then long-run efficiency would dictate that it not be restricted at all. The recognition of such long-run efficiency may well be the cornerstone of arguments for same-sex marriage and other minority rights.

4 Appendix

Proof to Result 1:

If the government chooses the policy $e = 0$, $S(\theta^o) = \frac{1}{-p_h(0,h^o)}$ and $S'(\theta^o) = \frac{B'(\theta^o)}{p(0,h^o)}$ and the injurer chooses to commit crime, her optimal choice is $\theta = \theta^o$ and $h = h^o$. This can be seen as follows. Recall that the injurer chooses θ and h to solve equations 2.3 and 2.4. The injurer will choose $\theta = \theta^o$ and $h = h^o$ when $e = 0$ if $\bar{\theta}$ and s are such that

$$B'(\theta^o) = p(0, h^o) S'(\theta^o)$$
$$-p_h(0, h^o) S(\theta^o) = 1$$

The first equation yields $S'(\theta^o) = \frac{B'(\theta^o)}{p(0,h^o)}$. The second equation yields $S(\theta^o) = \frac{1}{-p_h(0,h^o)}$. Note that in order for the injurer to choose to commit crime, it must be that $B(\theta^o) - p(0, h^o) S(\theta^o) \geq B(0)$. Substituting in $S(\theta^o) = \frac{1}{-p_h(0,h^o)}$ and rearranging yields $\frac{p(0,h^o)}{p_h(0,h^o)} \leq B(\theta^o) - B(0)$. Since $\epsilon_{ph}(0, h^o) = -\frac{h^o p_h(0,h^o)}{p(0,h^o)}$, this yields the condition that $\epsilon_{ph}(0, h^o) \geq \frac{h^o}{B(\theta^o)-B(0)}$.

Since the injurer is choosing the efficient levels of consumption and hiding and the government is not incurring any costs, this must be the optimal policy. ∎

Proof to Result 2:

Recall the government's maximization problem. The government chooses $S(\theta)$, $S'(\theta)$ and e to maximize the sum of utilities. Since the participation constraint is binding, however, the government will not be able to set $S(\theta)$ as high as it would like. Thus the necessary first order conditions for the government's problem are given by

$$[B'(\theta^*) - C_\theta(\theta^*, h^*)] \frac{\partial \theta^*}{\partial S(\cdot)} - [C_h(\theta^*, h^*) + 1] \frac{\partial h^*}{\partial S(\cdot)} \; > \; 0 \qquad (4.1)$$

$$[B'(\theta^*) - C_\theta(\theta^*, h^*)] \frac{\partial \theta^*}{\partial e} - [C_h(\theta^*, h^*) + 1] \frac{\partial h^*}{\partial e} - \kappa'(e) \; \leq \; 0 \qquad (4.2)$$

$$[B'(\theta^*) - C_\theta(\theta^*, h^*)] \frac{\partial \theta^*}{\partial S'(\cdot)} - [C_h(\theta^*, h^*) + 1] \frac{\partial h^*}{\partial S'(\cdot)} \; = \; 0 \qquad (4.3)$$

where the inequality in 4.2 holds with equality if the optimal monitoring effort is positive.

At this point, the following lemma concerning the comparative statics about the level of the sanction, the marginal sanction and monitoring will be of use.

Lemma 1: *When the injurer chooses to commit crime, the effect of government policy on the choice of consumption and hiding is as follows. Both consumption and*

hiding are increasing in the level of the sanction. Both consumption and hiding are decreasing in the marginal sanction. Consumption and hiding may be either increasing or decreasing in monitoring effort, although if hiding decreases, so does consumption.

Proof:

When committing crime, the injurer's choices of consumption and hiding are characterized by equations 2.3 and 2.4. Recall that the government is able to change $S(\theta)$ without changing $S'(\theta)$ and vice-versa. Thus $S(\cdot)$ and $S'(\cdot)$ are two different instruments. Using Cramer's rule, the effects of a change in $S(\cdot)$ are given by

$$\frac{\partial \theta^*}{\partial S(\cdot)} = \frac{[p_h(\cdot)]^2 S'(\cdot)}{soc} > 0$$

$$\frac{\partial h^*}{\partial S(\cdot)} = \frac{-p_h(\cdot)[B''(\cdot) - p(\cdot)S''(\cdot)]}{soc} > 0$$

where *soc* denotes the second order condition $-[B''(\theta^*) - p(e, h^*) S''(\theta^*)] p_{hh}(e, h^*) S(\theta^*) - [p_h(e, h^*) S'(\theta^*)]^2 > 0$. Thus both consumption and hiding are increasing in the level of the sanction.

The effects of a change in the marginal sanction are given by

$$\frac{\partial \theta^*}{\partial S'(\cdot)} = \frac{-p(\cdot) p_{hh}(\cdot) S(\cdot)}{soc} < 0$$

$$\frac{\partial h^*}{\partial S'(\cdot)} = \frac{p_h(\cdot) p(\cdot) S'(\cdot)}{soc} < 0$$

and so both consumption and hiding are decreasing in the marginal sanction.

Finally, the effects of a change in monitoring effort are given by

$$\frac{\partial \theta^*}{\partial e} = \frac{[p_{he}(\cdot) p_h(\cdot) - p_e(\cdot) p_{hh}(\cdot)] S(\cdot) S'(\cdot)}{soc}$$

$$\frac{\partial h^*}{\partial e} = \frac{[B''(\cdot) - p(\cdot) S''(\cdot)] p_{he}(\cdot) S(\cdot) + p_h(\cdot) p_e(\cdot) [S'(\cdot)]^2}{soc}$$

Note that a sufficient condition for each to be decreasing in monitoring effort is $p_{he} > 0$. Consumption is decreasing in monitoring if and only if $p_{he} > \frac{p_e p_{hh}}{p_h}$. Hiding is decreasing in monitoring if and only if $p_{he} > \frac{-p_e p_h [S']^2}{[B'' - pS'']S}$. Thus $\frac{\partial h^*}{\partial e} < 0$ is sufficient for $\frac{\partial \theta^*}{\partial e} < 0$ if $\frac{-p_e p_h [S']^2}{[B'' - pS'']S} > \frac{p_e p_{hh}}{p_h}$. Rearranging yields $-[B'' - pS''] p_{hh} S - [p_h S']^2 > 0$, which must be true for the second order condition to be satisfied. ∎

Given these comparative statics, we now consider the first order condition on the marginal sanction, 4.3. Since it is not feasible to induce the injurer to choose θ and

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h such that $B'(\theta) - C_\theta(\theta, h) = 0$ and $C_h(\theta, h) + 1 = 0$ the only remaining solution entails $[B'(\theta^*) - C_\theta(\theta^*, h^*)] \frac{\partial \theta^*}{\partial S'(\cdot)} = [C_h(\theta^*, h^*) + 1] \frac{\partial h^*}{\partial S'(\cdot)}$, which can be rewritten as

$$B'(\theta^*) - C_\theta(\theta^*, h^*) = [C_h(\theta^*, h^*) + 1] \frac{\partial h^*/\partial S'(\cdot)}{\partial \theta^*/\partial S'(\cdot)} \tag{4.4}$$

Note that since the effect of the marginal sanction is negative on both consumption and hiding, it must be that $[B'(\theta^*) - C_\theta(\theta^*, h^*)]$ and $[C_h(\theta^*, h^*) + 1]$ have the same sign. If both are negative, then there is too much consumption and too little hiding relative to the efficient levels.

Now consider the first order condition on the level of the sanction, 4.1. Substituting in 4.4 yields

$$[C_h(\theta^*, h^*) + 1] \left[\left(\frac{\partial h^*/\partial S'(\cdot)}{\partial \theta^*/\partial S'(\cdot)} \right) \frac{\partial \theta^*}{\partial S(\cdot)} - \frac{\partial h^*}{\partial S(\cdot)} \right] > 0 \tag{4.5}$$

Thus it must be that $[C_h(\theta^*, h^*) + 1] < 0$ if and only if $\left[\left(\frac{\partial h^*/\partial S'(\cdot)}{\partial \theta^*/\partial S'(\cdot)} \right) \frac{\partial \theta^*}{\partial S(\cdot)} - \frac{\partial h^*}{\partial S(\cdot)} \right] < 0$. Since the effect of the level of the sanction is positive on both hiding and consumption, the term in square brackets is negative if and only if

$$\frac{\partial h^*/\partial S'(\cdot)}{\partial \theta^*/\partial S'(\cdot)} < \frac{\partial h^*/\partial S(\cdot)}{\partial \theta^*/\partial S(\cdot)}$$

Substituting in the expressions from Lemma 1 and rearranging yields $-[B'' - pS''] p_{hh} S - [p_h S']^2 > 0$, which must be true for the second order condition to be satisfied. Thus it must be that, in the second best, there is too much consumption and too little hiding.

Finally, let us consider the first order condition for monitoring effort. Substituting 4.4 into 4.2 gives

$$[C_h(\theta^*, h^*) + 1] \left[\left(\frac{\partial h^*/\partial S'(\cdot)}{\partial \theta^*/\partial S'(\cdot)} \right) \frac{\partial \theta^*}{\partial e} - \frac{\partial h^*}{\partial e} \right] \leq \kappa'(e) \tag{4.6}$$

Examining the second term in square brackets and simplifying yields $\frac{p_{he}(\cdot)}{p_{hh}(\cdot)}$. Thus this first order condition can be rewritten as

$$[C_h(\theta^*, h^*) + 1] \frac{p_{he}(\cdot)}{p_{hh}(\cdot)} \leq \kappa'(e)$$

where the inequality holds with equality if the optimal choice of e is nonzero. From above, we have that $[C_h(\theta, h) + 1] < 0$, so hiding will not be used if and only if $p_{he}(\cdot) > 0$. ∎

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