"THOU SHALT NOT COVET ...":  
CRIME, TEMPTATIONS AND MORAL VALUES*

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Abstract

We propose a theory addressing the role of moral values in the presence of temptation and self-control. The model is applied to the problem of crime in an economy where heterogeneous individuals are faced with different legal and illegal options. We characterize the conditions under which agents face temptation. If not resisted by exerting costly self-control, temptation leads to payoff dominated (‘irrational’) illegal actions. We study how moral values of legality, attaching moral costs to both illegal actions and their desire (temptation), may improve utility by decreasing the cost of self-control. Yet moral values may also prevent agents from undertaking ‘rational’ illegal choices, thereby decreasing their utility. The model provides a rationale for the puzzling observations that agents sometimes get involved in payoff dominated illegal actions while other times payoff dominating illegal actions are not undertaken. We find that only the middle class benefits from moral values of honesty while the poor prefer to be immoral and the rich amoral. Improved legal detection reduces equilibrium crime but it also increases temptation problems. As a result better legal enforcements makes moral norms of honesty more valuable for a larger set of individuals.

Keywords: Temptation, Self-Control, Crime, Endogenous Moral Values, Detection, Inequality.

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1 Introduction

We propose a theory addressing the problem of temptation and the role of moral values in a model of rational criminal choices. Since Becker (1968), economists have been studying crime as a rational choice, made by comparison of expected costs and benefits. Yet some criminal choices appear puzzling to the standard approach. In particular, two relevant observations are difficult to rationalize within the available theories:

1. There are crimes which are not committed, although their expected economic payoff is clearly positive.

2. There are crimes which are committed, although their expected return is clearly negative.

To fix ideas, it is useful to focus on a couple of examples. The observation of limited fiscal evasion even in the presence of very low detection probability has been considered puzzling by several authors. For example, calculating its expected return and its expected punishment, Becker and Posner argue that ‘if taxpayers responded only to the expected cost of evading taxes, evasion would be far more widespread’.¹ A particular instance is the situation in which a plumber (or any other service provider) comes to repair something at home and offers a price reduction if no bill is issued. If the offer is accepted, the proceeds from tax evasion are shared between the supplier and the customer. Detection probability, and expected punishment, is close to zero. Not surprisingly, many people accept. Yet what is to be explained is why some people reject the offer, demand a bill and choose to pay more. A possible explanation, informally suggested by Becker and Posner, but overlooked by crime economics, comes from the general observation that ‘most people do not believe it is moral to steal money even when there is little chance they will be found out’. In fact, as largely investigated in social psychology, deviations from relevant moral standards induce self-regulative emotions of guilt and shame, which change individual behavior. A peculiarity of moral values, differently from values enforced through social interactions, is that the moral costs are incurred at the very moment of deviating form the expected behavior. Furthermore, moral costs are effective sanctions independently of the fact that moral deviations are actually observed and

¹Becker and Posner has recently, and informally, addressed these issues in their blog pointing out the need to further investigate the interaction between moral values and rational illegal choices.
sanctioned by third parties. The consideration of moral values of honesty might thus contribute to solve the first puzzle.

An example of the second puzzle, coming from one of the authors’ personal experience, involves a cleaning lady who, after years of trustworthy service, started to steal small sums.\textsuperscript{2} Detection probability in this case was high. The costs incurred if detected were high as well, since they involved at the same time loss of job and of reputation, in a profession in which reputation is a key asset to find a new job. The small amounts stolen were surely not sufficient to compensate for these high expected costs. The cleaning lady explained her behavior in terms of overwhelming temptation, suggesting that she knew she was doing something wrong, both in terms of her moral standards and in terms of her material interests, but that the she could not control herself.\textsuperscript{3} Temptation thus offers a natural solution to the second puzzle. In fact, the fundamental relevance of the problem of temptation for crime choices is widely recognized by criminologists but it is overlooked by crime economics.

In both examples standard economic calculation of expected costs and benefits is not sufficient to rationalize observed behavior, whereas moral values and temptation arise as natural explanations. The present paper provides a first theoretical attempt to study crime, morality and temptation within a unified framework. It investigates a simple trade-off: on one side moral values may help overcome self-control problems; on the other side they may induce payoff-dominated choices. Let us proceed step by step and consider each building block of our theory at a time.

Crime economics has essentially neglected the role of morality, and it has almost exclusively focused on external (especially legal) punishment. This is especially surprising, given the fact that most cultures and religions explicitly attach a moral sanction to many common illegal actions. For instance, the Bible features commandments against homicide and theft, and analogous moral prescriptions can be found in different cultures. Since morality attaches psychological costs to breaking its prescriptions, the emergence of systems of moral values of honesty represents a potentially very powerful device to reduce illegal actions.\textsuperscript{4} Yet the experience of disutility associated to moral values may reduce their effectiveness. This naturally leads to the question of why individuals should adhere to moral values in the first

\textsuperscript{2}Although it is difficult to obtain reliable data on this type of illegal behavior, we collected abundant anecdotal evidence of similar cases.

\textsuperscript{3}Interestingly, she actually felt relieved upon discovery, because she should no longer feel guilty and ashamed for not being able to resist temptation.

\textsuperscript{4}According to Crocker and Park (2003) moral values are effective in changing individual behavior by inducing the immediate experience of the self-regulatory emotions of guilt for behaviors which are not in line with own moral standards.
place. If the answer is that they fear some form of external punishment, be it due to the state, the church, the neighbors, the peers or whoever, then crime economics may safely keep overlooking morality and concentrating on the ultimate source of external sanction. In turn, if individuals are inclined to be moral even in the absence of external sanctions, then morality is a much more relevant issue for crime economics.  

Besides morality, crime economics has also overlooked temptation and self-control. This is so despite the large emphasis put on such factors by criminologists outside economics like seminal work by Gottfredson and Hirschi (1990), who set the so called General Theory of Crime in criminology. Temptation involves an internal conflict, in the sense that I believe that a certain option is optimal for me, but at the same time I am tempted by another option. Such internal conflict may be represented by time inconsistent preferences, as in Laibson’s theory of hyperbolic discounting, but it may also result in consistent choices, if the cost of self-control is correctly anticipated. A natural source of temptation comes from the time structure of many choice problems: I can calculate what is optimal taking into account the discounted stream of all future consequences, and yet be tempted by what is most rewarding right now. We focus on this source of temptation and investigate how morality depends on the extent of self-control problems.

In this paper we provide a simple theoretical investigation of the interaction of temptation and moral values. The role of moral values in addressing self-control problems seems in line with well established moral traditions. For instance, the Bible does not only prohibit theft and adultery, but also the desire of other people’s goods and wife. It is not obvious to make sense at first sight of the need of a prohibition to both actions and desire of these actions. Making the feeling of desire

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5The exercise of rationalizing potentially costly moral values of legality is similar to the way in which Rotemberg (1994) addresses the question of why individuals would choose to be altruistic towards colleagues, when altruism is potentially costly. Yet while his answer is based on strategic complementarity, ours is rooted in an individual decision problem, with temptation and self-control.

6According to the Bible, the entire human history is a result of Adam and Eve’s temptation. In Genesis, 2:17, God tells Adam: ‘Of the tree of the knowledge of good and evil, thou shalt not eat of it; for in the day that thou eatest thereof thou shalt surely die’. In economics terms, we might say the payoff from eating of the fruit was clearly negative. As is known, the serpent tempted the woman and she and Adam ate the fruit: they could not resist temptation.

7We leave for future investigation the reciprocal analysis of how temptation depends on the strength of moral norms.

8The commandment against actions is: ‘You shall not commit adultery. You shall not steal.’ (Exodus, 20:12). The prohibition of desire is: ‘YOU SHALL NOT COVET your neighbor’s house; you shall not covet your neighbor’s wife, nor his male servant, nor his female servant, nor his ox, nor his donkey, nor anything that is your neighbor’s.’ (Exodus, 20:13). The title of the present paper comes from the ancient English version of this commandment.
immoral in itself can be rationalized if these actions are characterized by problems of temptation and require self-control. Moral values may help overcome temptation since, in case of breaking moral prescriptions, guilt and shame are typically suffered immediately, upon act. This implies that, unlike punishment by third parties, the enforcement of the rule and the associated punishment are not delayed in time and are not contingent upon detection.

We show that, in presence of inequality in the distribution of legal and illegal opportunities, the trade-off associated to moral values is not monotonic across income classes. We therefore can ask the question whether an individuals finds it rewarding to adhere to a system of moral values. This choice involves trading off the potential utility costs and the alleviation of self-control costs. In particular, the middle class (defined more precisely below) turns out to be the most exposed to temptation and therefore the one which gains more from moral values. In turn, individuals belonging to the lower and to the upper class tend to be immoral (and mostly illegal) and amoral (and mostly honest, with a few high return criminals), respectively.

The set up also allows to investigate the question whether, in the present setting, legal and moral enforcement are complements or substitutes. While legal enforcement reduces crime, it also raises self-control problems and correspondingly increases the scope of moral values. So legal and moral enforcement turn out to be complements. This result hinges upon the idea that temptation depends on the difference between static and dynamic optimality, and that, when future punishment is contingent upon detection, a higher detection probability widens this difference. Finally, we discuss the potential insurance role of morality and a number of possible general equilibrium effects related to the interactions between legal and illegal individuals as well as the interactions between moral and immoral ones.

The paper is organized as follows. In Section 2 we present the basic set up, the problem of temptation and self-control and we characterize the equilibrium in the absence of moral values. In Section 3 we study the role of moral values and their interaction with the level of legal enforcement. Finally, in Section 4 we discuss the results and conclude.

2 A model of crime, temptation and moral values

2.1 Model Set Up

Self-Control Preferences. Individuals may suffer from temptation. Following Gul and Pesendorfer (2001), rational individuals anticipate that they might need to
exert costly self-control in order to resist temptation. Each individual chooses an action $x \in A$ to maximize:

$$U(x) = \left\{ u(x) + v(x) - \max_{y \in A} v(y) \right\}$$  \hspace{1cm} (1)

where $A$ is the choice set and $u$ and $v$ represent two different rankings over possible choices, referred to as commitment and temptation ranking, respectively. The difference $[\max_{y \in A} v(y) - v(x)]$ is the cost of self-control paid by an individual choosing option $x$: it is zero if the most tempting option is chosen and positive otherwise. When deciding, individuals take into account both the "farsighted" consequences of their actions, as reflected in $u$, and the potential cost of self-control, given by $[\max_{y \in A} v(y) - v(x)]$.

In the context of our set up, $A = \{0, 1\}$ where 1 denotes to the legal option and 0 the illegal one. For simplicity we take the two options as mutually exclusive. The payoff of the legal option (e.g. market wage) is denoted by $w > 0$ while the payoff of the illegal action (e.g. returns from some criminal activity) is $c > 0$. Illegal actions are detected with probability $d \in (0, 1)$.\footnote{This formulation may either reflect formal detection and punishment by the judiciary system or informal social sanctions.} If the illegal action is chosen and is detected the agent is punished and receives a payoff $(1 - d)c$ (which implies a punishment if detected equal to $-c$).

The commitment and temptation rankings are given by,

$$u(x) = \begin{cases} 
    w, & \text{if } x = 1 \\
    (1 - d)c, & \text{if } x = 0
\end{cases}$$ \hspace{1cm} (2)

$$v(x) = \begin{cases} 
    w, & \text{if } x = 1 \\
    c, & \text{if } x = 0
\end{cases}$$ \hspace{1cm} (3)

where temptation is modelled as an underestimation of the detection probability $d$ (the assumption of a full neglect of detection is made only for illustration). Temptation may be equivalently modelled to a form of non exponential discounting related to the fact that illegal returns materialize immediately, whereas potential sanctions take place in the future. In particular the payoff (3) can be interpreted as resulting from an extreme form of impatience.\footnote{One could explicitly consider the fact that punishment typically takes place in a future period. Let $\beta$ be the individual discount factor. The payoff of the illegal option according to the commitment} Temptation can be therefore interpreted as a pressure to base decisions only on immediate costs and benefits, disregarding the future.
Moral Values. Agents with moral values concerning legality suffer a (moral) utility loss which is associated to a psychological cost of guilt to illegal actions. Following the cited literature in Social Psychology we postulate that these emotions are experienced for the very fact of deviating from own moral standards irrespective of the fact that the illegal acts are actually detected and punished (i.e. subject to public observability). The moral cost associated to deviations from own moral values are not deferred in time, unlike formal or social punishment, but is rather immediately incurred when choosing an illegal action. Suppose therefore that there is a moral norm of legality which attaches a utility cost $\mu > 0$ to individuals embracing it. In the following we consider moral values that induce self-regulative emotions of guilt, $\mu$, not only when deviating from own moral standards but also when feeling tempted from deviations. Hence the disutility cost can be incurred by agents either when actually deviating from moral standards (e.g. “Thou shalt not steal”) but it also when experiencing the temptation to do so (“Thou shalt not covet”). In our set up attaching a moral cost to actual deviation would amount to a change of utility in the commitment ranking: $u(0) = (1 - d)c - \mu$ while the moral cost associated to the desire would changes the temptation ranking $v(0) = c - \mu$. In fact, as shown below, in the absence of the moral cost associated to the perception of being illegal no agents would have an incentive to adhere to such moral values.\footnote{This issue is discussed in more details later on.}

2.2 Equilibrium

Temptation in the absence of Moral Values. For the time being we consider a world in which moral values play no role and concentrate attention to the problem of individual choice in the absence of any moral cost associated to undertaking illegal actions. This amounts to set $\mu = 0$.

Consider first what would happen in a standard set up (\textit{a la} Becker) that does not consider self-control problems. In this case the utility function coincides with $u(x)$. In this case agent chooses the illegal option whenever it delivers a larger economic payoff: $u(0) = (1 - d)c > w = u(1)$.

In a standard framework it cannot be that payoff dominated illegal actions are undertaken and that payoff dominating illegal actions are not undertaken. The utility and temptation ranking can be written as

\begin{align*}
    u(0) &= c - \beta dc \\
    v(0) &= c - \beta_T dc
\end{align*}

with $\beta_T < \beta$. Our model amounts to the limit case in which $\beta = 1, \beta_T = 0$.\footnote{This issue is discussed in more details later on.}
ity formulation (1) is linear. This implies that optimal choices of risk neutral agents amounts to a simple comparison of expected economic payoffs. Therefore with linear utility this framework cannot explain either side of the puzzling evidence reported above. Risk aversion could help explaining one side of the puzzle since illegal activities which are profitable in term of expected payoffs may not be undertaken if they are risky. Yet in many case the degree of risk aversion that would be required to rationalize the lack of illegal actions would be unreasonably large as discussed above. Furthermore risk aversion makes it even more difficult to rationalize the observation of payoff dominated illegal actions. There is a large evidence on the importance of moral values of legality in preventing individuals from undertaking illegal but economically profitable actions. The fact that moral values of legality can serve important coordination purposes is well investigated. But one important open question is, however, related to the fact that in most instances from an individual point of view morality imposes a cost (in terms of foregone economic payoff) without any obvious direct benefit. Finally, in the presence of exogenous and universal moral values it is even more difficult to explain the observation of economically irrational crimes. In this paper we argue that the explicit consideration of problems of self-control and of moral values which are instrumental to improve individual utility (i.e. that delivers direct costs and benefits) may help reconciling both puzzles.

Individuals choose the legal option if and only if $U(1) \geq U(0)$. As

**Lemma 1 (Temptation and self-control)** For any $\{w, c, d\}$:

- If $w > c$, then legality is optimal for both $u$ and $v$.
- If $w < (1-d)c$, then crime is optimal for both $u$ and $v$.
- If $w \in [(1-d)c, c]$, then legality is optimal for $u$, but crime is tempting.
  - If $w \in [(1-d)c, w_L(c)]$, then temptation is overwhelming and the option with lower expected returns is chosen.
  - If $w \in [w_L(c), c]$, then temptation is resisted but a self-control cost is paid.

**Proof**

Consider first the case in which $w > c$, which implies $U(1) = w > (1-d)c + c - w = U(0)$, so that $x^* = 1$. On the contrary if $w < (1-d)c$, then $U(1) = w + w - c < (1-d)c = U(0)$, so that $x^* = 0$. If $w \in [(1-d)c, c]$, then $U(1) = 2w - c \geq (1-d)c = U(0) \iff w \geq w_L(c) \equiv (1 - \frac{d}{2})c$, which implies that $x^* = 1 \iff w \geq w_L(c)$. 

8
The previous Lemma states that, as in the standard framework, the illegal option is rationally chosen by those individuals for which the legal returns are too low, i.e. \( w < (1 - d) \) and is rationally avoided by those with large enough returns, \( w > c \). Individuals with intermediate legal returns, \( w \in [(1 - d)c, c] \), face temptation. The commitment ranking implies that the illegal choice is payoff dominated by the legal one but at the moment of actually having to choose these individuals are tempted. This is illustrated in the figure below.

The actual choice in the case of the temptation depends on individuals’ cost of self-control which is given by \( v(x) - \max_{y \in A} v(y) \) which is related to the perceived attractiveness of the illegal action in the temptation ranking. The larger is the perceived attractiveness of the illegal action in the ranking \( v \) the larger is the cost of self-control. We can therefore identify a threshold of the legal returns \( w_L(c) \) such that only agents with \( w \) above this threshold would resist temptation while for all \( w < w_L(c) \) temptation is overwhelming and agents give in to the illegal action. This is illustrated in the following figure.
Lemma 2 (Equilibrium choices without moral values) For any $c$, the legal option is chosen if and only if $w \geq w_L(c) \equiv (1 - d^2) c$.

The prediction stated in the previous Lemma is in line with the standard prediction that the lower the legal returns relative to the illegal ones and the more likely is that individuals get involve in illegal activities. In fact, consider the case in which there is a distribution of illegal opportunities with expected average equal to $c$. An interpretation of the previous Lemma is that, in the presence of inequality in the distribution of legal returns $w$, the poor are expected to get involved more often in illegal activities while the rich choose legality. The middle class is tempted and splits in those who commit irrational crimes and those who resist the temptation at the cost of paying self-control costs.

If everybody faces the same random distribution of $c$, this holds true on average, with some legal behavior by the poor and some illegal behavior (with very high returns) by the rich. If $w$ and $c$ are correlated, then the same analysis applies within each income class.

The role of detection. The next question is on the role of improved detection of illegal activities. Consider the case in which detection of crime can be improved at zero cost. In a set up without temptation an increase in detection is expected to lead to a reduction in crime. If illegal activities involve any (general equilibrium) cost for society and $d$ can be increased at zero costs, then an increase in detection leads to an increase in social welfare.

In the presence of temptation a costless increase in detection probability is not necessarily welfare improving, however. The reason is that the very existence of temptation in this set up is related to an instantaneous undervaluation of the detection probability at the moment of having to make the actual choice. Following Lemma ??, for each individual endowed with a legal opportunity $w$, an increase in the probability of detection $d$ reduces the set of ”rational” illegal choices but, at the
same time, it increases the set of illegal which are subject of temptation. The set of legal actions increases following the increase in $d$. Nonetheless, also the number of illegal action which are undertaken irrationally under temptation increases as well as the total costs of self-control sustained in equilibrium. As a result,

**Lemma 3 (The role of increased detection)** An increase in $d$ reduces crime but raises both the number of crimes realized due to temptation and equilibrium total costs of self-control. Equilibrium utility is not necessarily highest for $d = 1$.

### 3 Moral values

The existence of temptation allows to rationalize the observation of irrational crimes which are undertaken by individuals giving in to temptation. We now consider the case in which agents are endowed with moral values of honesty. Deviations from own moral values leads to self-regulative emotions of guilt. We consider a set of moral rules in which agents are morally sanctioned not only when indulging in illegal actions (“thou shalt not steal”) but also when experiencing the feeling of temptation “thou shalt not covet”. In this case the introduction of moral values have two effects. On the one hand it reduces the costs of self control which sustained by agents in equilibrium. This implies that it is cheaper to resist temptation for those that already were exerting self-control and it makes it feasible to resist to the temptation to some agents which were giving in to it. As a result the range legal actions increases.

**Lemma 4 (Equilibrium choices with exogenous moral values)** *Given $c$, the legal option is chosen by individuals with moral values $\mu$ if and only if $w \geq w_L(c) - \mu$.*

The set of agents resisting temptations in the presence of moral values is given in,

**Corollary 1 (When morality triggers legality)** *Given $c$ and $\mu$, individuals with $w \in [w_L^M(c), w_L(c)]$ chose the legal option if and only if endowed with moral values.*

The larger the strength of moral values, $\mu$, the larger is the effect on the set of legal agents. This is illustrated in the following figures:
The existence of moral values involves two types of costs, however. In the first place moral values may be not enough to induce an agent to resist temptations. In this case the agent takes irrational illegal actions since the cost of self-control is too large but, in turns, he pays disutility cost of violating his morality. Furthermore some moral agents may refrain from taking illegal actions which are indeed rational thereby obtaining an irrationally low payoff from legality. As a result not all agents necessarily gain from the adherence to a system of moral values which punish dishonesty and temptation. We next characterize the set of those which gain from adhering to such a system of values.
Denote by
\[ w^\mu_M(c) \equiv \max \left\{ (1-d)c, \left( 1 - \frac{d}{2} \right) c - \frac{\mu}{2} \right\} \] (4)
and notice that for any \( c \geq 0 \), and any \( \mu \geq 0 \), we have \( w^\mu_L(c) < w^\mu_M(c) < c \) which implies that \( w^\mu_M(c) = (1-d)c \iff \mu \geq dc \). We have the following,

**Proposition 1 (Winners and losers from moral values)** Given \( c \) and \( \mu \), equilibrium utility when endowed with moral values, relative to the case of no moral endowment, is

- unchanged if and only if either \( w \geq c \) or \( w = w^\mu_M(c) \)
- strictly lower if and only if \( w < w^\mu_M(c) \)
- strictly higher if and only if \( w \in (w^\mu_M(c), c) \)

The previous Proposition characterizes the change in individual expected utility which would be experienced by an individuals if would adhere to a system of moral values of honesty. For all agents with \( w < w^\mu_M(c) \) the adherence to a system of moral values leads to a strict reduction in expected utility. In the presence of moral values these individuals are worse off, compared to the case in which they do not have moral values. This is the case for two reasons. They may avoid to get involved in "rational" illegal actions thereby receiving a lower economic payoff. If the moral value is not strong enough they would still choose the illegal option thereby paying the moral cost of not being honest. This implies that, having the possibility to choose to adhere to moral values of honesty these individuals would rather prefer to be immoral. The expected utility of agents with large legal returns (relative to the expected illegal ones), i.e. \( w > c \), is not affected by the fact that they are moral or not. Hence these individuals would be completely indifferent between having moral values or not. We denote this set of agents as amoral.

Finally all agents with \( w \in (w^\mu_M(c), c) \) strictly benefit from the adherence to a system of moral values of honesty. This set of agents is composed by two types of individuals. The first group is formed by those that would expect to stay legal even in the absence of moral values but only by exerting costly self-control. For these agents the moral values increases expected utility by reducing the cost of self control although it does not change their actual choices. The second group is composed by those that, in the absence of moral values, would give in to payoff dominated illegal actions but would resist temptation by being moral. For these
agents being moral is indeed the only reason why they do not end up with taking payoff dominated illegal actions. Notice that from (4), the maximum size of the group that benefits from adhering to moral values of honesty is given by all the individuals with \( w \in [(1 - d)c, c] \), that is the set of agents subject to temptation.

\[
\mu < \frac{d}{2}c
\]

\[ \begin{array}{c}
\text{Immoral} & \text{Moral} & \text{Amoral} \\
0 & (1 - d)c & c \\
\end{array} \]

Suppose one can refuse the received moral endowment

\[
\mu \in \left( \frac{d}{2}c, dc \right)
\]

\[ \begin{array}{c}
\text{Immoral} & \text{Moral} & \text{Amoral} \\
0 & (1 - d)c & w^\mu_M(c) \\
\end{array} \]

\[
\mu > dc
\]

\[ \begin{array}{c}
\text{Immoral} & \text{Moral} & \text{Amoral} \\
0 & (1 - d)c & w_L(c) \\
\end{array} \]

The next question is on the relationship between legal enforcement and moral enforcement. Lemma 3 imply that improvements in the ability of detecting (and punishing) crimes leads to an increase in temptations. Also Proposition 1 states that the set of individuals that finds it strictly profitable to adhere to moral values of morality are those who expect to face problems of temptations which can be solved in the presence of a system of moral values. In fact if \( d = 0 \) no agents would suffer from problems of temptation since crime would be either rational or irrational. Furthermore in these conditions no agents would have incentives to be endowed with moral values of legality. We have,
Proposition 2 If \( d = 0 \) no agents suffer from temptation and illegal actions are undertaken if and only if \( c > w \). An increase in the probability of detection \( d \) increases the range of temptation and enlarges the set of agents that can increase their expected utility by adhering to a system of moral values of legality.

The model predicts that an increase in the effectiveness of legal detection reduces equilibrium crime but it leads to an increase in temptation and irrational illegal actions. As a result it does not necessarily increase total utility in the community. Finally larger detection make moral values of honesty more valuable from the individual point of view.

The role of risk aversion. Before discussing the possible extension and application of the simple theory presented above we briefly discuss the role of risk aversion for the problem at hand. The main qualitative features of the analysis do not depend on the assumption of linearity of the utility function. With risk aversion the range of situations in which agents suffer from problems of self-control is widened, however. Consider now the problem with a concave direct utility of consumption:

\[
\begin{align*}
  u(x) &= \begin{cases}
    \varphi(w), & \text{if } x = 1 \\
    (1-d)\varphi(c) + d\varphi(0), & \text{if } x = 0
  \end{cases} \\
  v(x) &= \begin{cases}
    \varphi(w), & \text{if } x = 1 \\
    \varphi(c), & \text{if } x = 0
  \end{cases}
\end{align*}
\]

with \( \varphi(0) = 0 \) (wlg), \( \varphi' > 0 \) and \( \varphi'' \leq 0 \). Individuals choose the legal option if and only if \( U(1) \geq U(0) \). Let \( w^*_L(c) \) be the level of wage such that the agent is indifferent between resisting and giving in to temptation:

\[
\varphi\left( w^*_L(c) \right) = \left( 1 - \frac{d}{2} \right) \varphi(c)
\]

Lemma 5 For any \( w \) and \( c \) we have the following:

- If \( w > c \), then legality is optimal for both \( u \) and \( v \).
- If \( w < c \), then crime is optimal for both \( u \) and \( v \).
- If \( w \in [\varphi^{-1}[(1-d)\varphi(c)], c] \), then legality is optimal for \( u \), but crime is tempting.
  - If \( w \in [\varphi^{-1}[(1-d)\varphi(c)], w^*_L(c)] \), then temptation is overwhelming and the option with lower expected returns is chosen.
– If \( w \in [w^*_L(c), c] \), then temptation is resisted but a self-control cost is paid.

• If \( w < \varphi^{-1} [(1 - d) \varphi(c)] \) then the illegal option delivers the largest utility and is chosen (without temptation).

**Proof**

If \( w > c \), then \( U(1) = \varphi(w) > (1 - d) \varphi(c) - \varphi(w) = U(0) \), which implies \( x^* = 1 \). If \( \varphi(w) < (1 - d) \varphi(c) \), then \( U(1) = \varphi(w) + \varphi(w) - \varphi(c) < (1 - d) \varphi(c) = U(0) \), so that \( x^* = 0 \). If \( w \in [\varphi^{-1} [(1 - d) \varphi(c)], c] \), then \( U(1) = 2\varphi(w) - \varphi(c) \geq (1 - d) \varphi(c) = U(0) \iff w \geq w^*_L(c) \equiv (1 - \frac{d}{2}) \varphi(c) \), which implies that \( x^* = 1 \iff w \geq w^*_L(c) \).

The existence of risk aversion has several implications, however. In the first place risk aversion may help understanding the puzzle that payoff superior illegal actions are not undertaken. The amount of risk aversion required to justify the fact that, e.g. agents do not evade taxes in the cases with negligible detection probability it is unreasonable. Most importantly, the previous Proposition states that risk averse agents suffer more from self-control problems. This is the case since the lower bound decreases and the upper bound increases. This also implies that, for any given distribution of \( w \) and \( c \), it is especially the poor people that would face problems of self-control. The larger the risk aversion and the larger the set of realizations characterized by temptation and the larger the incentive to adhere to moral values of honesty.

### 4 Discussion and Concluding Remarks

We propose a theoretical framework, in which morality imposes a trade-off between its utility costs and the alleviation of self-control problems. This theory fills a gap and solves two puzzles in crime economics, namely the fact that some crimes are not committed although they have a positive economic payoff and other crimes are committed although their economic payoff is negative. While other explanations might in principle be proposed for the two puzzles, their appeal may be limited. For instance, risk aversion may help explain the first puzzle: if crime is riskier than legality, risk averse individuals refrain from crimes with positive expected payoffs. In turn, impatience may help explain the second puzzle: if crime pays off immediately and potential punishment comes only in the future, high enough discount rates always make net expected returns positive. Yet, in the the examples discussed in the introduction, risk aversion and impatience should be unreasonably high to justify...
why some people reject the plumber’s offer or why the cleaning lady (suddenly) started to steal. Further, while useful for the first puzzle, risk aversion makes it even harder to explain the second. Conversely, high discount rates make it harder to explain the first one. Other accounts, related to the emotional state, may easily be represented in terms of temptation.

In the present model we concentrate attention on the instrumental role of moral values as a self-control device. The peculiarity of moral values makes them particularly suited as a self-control device since they are based on ”internal” rather than ”external” punishments (unlike social norms based on social sanctions). This also implies that the self-regulative emotions of guilt associated to misbehavior are experienced at the very moment of deviating from the moral norms, e.g. at the moment of undertaking an illegal activity or at the moment of experiencing the temptation rather than in the future. As a result the analysis differs from most of previous investigations of the economic role of moral values, which have so far mainly concentrated either on their role of coordination devices (allowing selection of the best among different equilibria) or on their role in sustaining equilibria which would otherwise not emerge in competitive markets. While we concentrated attention on the problem of temptation in crime, the theory can be more generally applied to rationalize the observation of the emergence and persistence of moral values in several problems, where temptation is particularly relevant. This includes excessive consumption and moral values supporting patience and savings, or choices of work and leisure and the associated moral values or hard work, to name some.

The theory delivers several novel results. An important result of our analysis is that the middle class is the most exposed to self-control problems and therefore it is also the one that mostly gains from strict moral values. In the current analysis we limit our attention to investigate how moral values change the expected utility of heterogenous individuals. We leave for future research the investigation of the problem of their emergence (i.e. the problems of the identification of norms setters), transmission and persistence.

A second result is that legal and moral enforcement are complements rather than substitutes. This result may appear counterintuitive at first sight. The intuition is, however, straightforward once one considers the role of increased detection on temptation. Increased legal effectiveness reduce the returns to illegal activities. Nonetheless more strict legal detection tend increase the risk of falling into temptation since it increases the range of payoff dominated illegal actions and this makes moral values of honesty even more valuable. A third result is that risk aversion makes
self-control problems even more serious by increasing temptation. This implies that in the presence of risk averse agents morality also plays an insurance role.

Finally, the model studies individual equilibrium choices and the effective of moral values in a partial equilibrium set up. This implies that individual choices do not depend, and are not influenced by, choices of other agents in society. The model can be generalized to study the interactions between agents in a general equilibrium framework. This would allow to study a series of interesting issues which have been so far addressed neglecting the problem of temptation and the interactions between legal and moral enforcements. In general equilibrium both the legal enforcement (detection probability) and the strength of moral values (which is related to the moral cost of deviations from moral standards) are related to the structure of the community. In particular the effectiveness of a policy of legal detection is likely to decrease with the share of illegal acts performed in the economy. Similarly the strength of moral values depends on the degree of compliance to the norm in the relevant community which is related, e.g. to the existence of a sufficiently widespread culture of honesty. Preliminary analysis suggest that the consideration of these interactions between individual choices and the structure of the community generates multiple equilibria and deliver non trivial policy predictions on the role of legal enforcements and morality.
References


