Introduction

Economic analysis of criminal law exploits social science methodologies (economics, behavioral economics, psychology and even sociology) to examine and evaluate the role of criminal law in society; the nature, and optimal size, of criminal sanctions; and the doctrines governing criminal law such as *actus reus*, *mens rea* and the nature of criminal law defenses. Further, economic analysis of criminal law is also concerned with issues that traditionally are not classified as criminal law questions: law enforcement policy, evidence law and procedural law.

Criminal law sanctions are perceived by law and economics theorists as incentives for individuals to behave in a way that is socially optimal. In contrast to the retributive tradition, which views the primary goal of criminal law as the punishment of wrongdoers for past actions, economic analysis considers the most effective incentives for achieving socially optimal conditions in the future. Thus, under the economic view of criminal law, the primary role of criminal sanctions is to influence future behavior (typically by deterring and sometimes also by incapacitating criminals). Under this view, the punishment is a necessary but unavoidable evil (given its costs to society and to the criminal). We ought to use criminal law sanctions only when they reduce the costs of anti-social behavior. These costs include the direct costs of crime as well as the costs of precautionary measures against crime.

This collection is by no means an exhaustive survey aimed at representing all scholarly traditions of economic analysis of criminal law. However, it includes chapters representing different traditions and approaches, including theoretical economic models, behavioral findings and empirical research. Designing an optimal system of criminal law requires delineating what wrongs ought to be criminalized and what wrongs ought to be regulated by tort law or administrative law (Harel, Mungan, Hylton). It also requires determining the size of sanctions on the basis of a complex balance between deterrence-based and incapacitation considerations (Harel, Miceli). The size and nature of optimal sanctions may differ in accordance with the identity of the victims (Mikos) or the identity of the perpetrators (Arlen). Extrinsic societal circumstances, such as technology (Klick, MacDonald and Stratmann) and even distribution of wealth (Tabbach), may be relevant to criminal law policy or impact its effectiveness (or both). It is not sufficient, however, to discern the optimal policy; it is also crucial to design institutions in a way that incentivizes officials to implement the optimal policies (Garoupa) and even recruit the help of private actors (Arlen). Further, effective criminal law policy cannot presuppose the rationality of perpetrators; it ought to be informed by behavioral studies and by a nuanced understanding of human psychology (Guttentag).

Chapter 1 (Harel)

This chapter is a survey of criminal law and economics. It examines three main traditions in law and economics. First, it examines traditional economic analysis of criminal

law, which is based on the premise that criminals are rational (and, consequently, react to incentives provided by the legal system). Second, it explores the social norms tradition and the behavioral law and economics tradition, which question the assumption of rationality and are inclined to exploit psychological and sociological findings in designing criminal law prohibitions. Last, it discusses the “happiness” research founded on the recent work by Daniel Kahneman.

The traditional economic analysis of law is based on the premise that the criminal is rational, and it aims at designing incentives that minimize the sum of the costs of crime and the costs of precautions against crime. This section of the survey starts by identifying the anti-social behavior that ought to be deterred by using legal sanctions. Next, it examines what type of legal sanctions ought to be used: civil liability, administrative sanctions, criminal sanctions or others. It investigates the size of the optimal expected sanction and its optimal composition. It also explores the economic rationale of the rules governing criminal law doctrine: *actus reus*, *mens rea*, the optimal scope of defenses, etc.

The second section of the survey examines theories aimed at complementing economic theory by exploiting sociological, psychological or behavioral observations. This enterprise requires using empirical and experimental methodologies. Criminal law influences individuals by influencing their beliefs and preferences. If there are systematic biases that distort the judgments of individuals and their choices, such biases change individual behavior. Given that these biases and distortions are systematic and predictable, legislatures and policy-makers can make use of these biases and distortions in a way that is socially beneficial.

The final section of the survey examines the literature on happiness and criminal law. Jeremy Bentham believed that happiness has non-instrumental (intrinsic) value and that maximizing happiness ought to guide legislatures and policy-makers. This position has enjoyed a revival in recent years due to the work of psychologists, in particular the recent work by Daniel Kahneman. Kahneman distinguishes between two conceptions of utility: decision utility and experienced utility. Decision utility is based on the subjective evaluation of the individual with respect to the future utility derived from his decision. It therefore guides the actual decisions of individuals. Experienced utility, on the other hand, is the contemporary incarnation of Benthamite hedonic utilitarianism; it refers to the happiness that is experienced by the individual. Kahneman believes that experienced utility often differs from decision utility in ways that can be predicted and measured.

Both retributivists and utilitarian theorists should be interested in happiness research. Some retributivists (subjective retributivists) believe that the size of a sanction should be determined on the basis of the subjective disutility experienced by the criminal. Subjective retributivists call for equal (un)happiness for identical crimes (rather than equal sanctions for identical crimes). Deterrence theorists believe that we ought to deter crime, which requires the imposition of a sufficiently large sanction. Such a sanction ought to be sensitive to the expectations of the criminal with respect to the disutility resulting from the sanction. The two approaches focus on different types of happiness: retributivists care about experienced utility (the mental state of the person who is sentenced) while deterrence theorists focus on expected utility (based on the predictions of individuals concerning their future happiness) because of its deterrent effects.

Chapter 2 (Mungan)

This chapter explores the boundaries between criminal law and other fields of the law. Law uses various mechanisms to regulate behavior: tort law, administrative law, criminal law, etc. To evaluate the desirability of these mechanisms, Mungan first identifies the consequences of the criminalization of an act. These consequences include both doctrinal consequences (i.e., consequences resulting from the nature of the criminal law and criminal procedure) and social consequences (in particular, the stigma attached to criminal conviction). One important (doctrinal) consequence of criminalizing an act is the stringent standard of proof required in criminal law. A second (doctrinal) consequence is the detachment of the criminal sanction from the size of harm resulting from the crime. Typically, criminal sanctions (unlike tort law sanctions) impose much greater costs on criminals than the harms caused by the crime. A third (social) consequence of criminalizing an act is the negative attitude towards the perpetrator of the criminal act (stigma effects). The challenge of the legal theorist is to establish when these consequences are congenial to efficiency and why.

It is well established in the literature that intentional acts resulting in grave harms ought to be criminalized. This is primarily because of the need to impose harsh sanctions that reflect the gravity of the harms resulting from such crimes. Such sanctions ought to be particularly high given the typically low probability of detection of the criminals committing such acts.

High sanctions of the type required to deter intentional wrongs resulting in grave harms cannot be monetary sanctions, because offenders' wealth will not suffice to pay fines of the necessary magnitude. The problem of judgment-proof offenders necessitates the use of non-monetary sanctions such as imprisonment to deter judgment-proof offenders. Hence, it is necessary to resort to non-monetary sanctions of the type characterizing criminal law, e.g., imprisonment.

But why should the procedure in criminal trials be so stringent? Mungan identifies an important consideration justifying the stringency of criminal procedure. Criminal conviction provides information concerning a convict's criminal dispositions. This information is useful for third parties such as potential employers. The stringent procedural requirements used in criminal trials are necessary to guarantee the reliability of such information. Yet Mungan does not consider the fact that stigma attached to criminal conviction also imposes costs on third parties, as some third parties who could benefit from interaction with the criminal are pressured against their will to distance themselves from criminals.

Criminal law is also used in cases of intentional wrongs that result in smaller harms. Why could not such behavior be governed by non-criminal norms? After all, the sanctions required in order to deter such behavior typically do not result in insolvency. Mungan believes that non-criminal norms may fail to deter such wrongs because of the relatively small benefits resulting from civil litigation. Tort law remedies may fail to deter because the expected litigation costs are too high and there are psychic costs to the litigation that deter potential plaintiffs from pursuing the litigation. Punitive damages may remedy such defects but they suffer from other defects, e.g., grave risks of fraudulent litigation.

Mungan also explains why criminal law does not typically regulate unintentional harms. In the case of unintentional harms, the probability of detection is high, and con-

sequently the sanctions necessary to deter such behavior need not be as large. It follows that monetary sanctions (characterizing tort law) may suffice to deter such behavior. Furthermore, in cases of unintentional harms there is a concern that the criminalization of unintentional acts would deter desirable activities. If inadvertently taking the umbrella of another may result in criminal conviction, I may be deterred from using umbrellas. Last, Mungan believes that unintentional behavior does not provide information concerning the anti-social dispositions of individuals. Hence, conviction for unintentional acts does not benefit third parties in the same way as conviction for intentional acts. This last point could be challenged on the grounds that it is often as desirable for third parties to know that a person is negligent as it is to know that he is inclined to commit intentional crimes. When I want to hire a cab, I may be very keen to know if the cabdriver is negligent.

Mungan analyses numerous considerations relevant to the criminalization of certain activities. What is particularly challenging is to balance the conflicting considerations and evaluate their relative weights. It seems to us that at the end of the day a careful analysis may expose the fact that there is a greater mismatch of economic considerations and existing criminal law doctrine and legal practices than envisaged by Mungan.

Chapter 3 (Hylton)

This chapter, like the preceding chapter by Mungan, explores the boundary between criminal law and other areas of law, such as tort law. One basic feature that separates criminal law from tort law is that the sanctions applied by the state – or, alternatively, the remedies sought by victims – are different and have different goals. Criminal law imposes penalties (fines, imprisonment or execution) that are designed to deter completely the offensive conduct at issue. Tort law, in contrast, imposes damage remedies: court awards that require the offender to compensate the victim by the amount of some estimate of the monetary value of the harm imposed by the offender on the victim. As Bentham urged, criminal law seeks to eliminate any prospect of gain on the part of the offender. Tort law seeks merely to require the offender to compensate the victim for his harm. Thus, if an offender gains \$100 from committing an offense, and the victim suffers a loss of \$50, the criminal sanction should be no less than \$100 while the tort damages award will be \$50.

What this difference in approach to sanctions reveals is that criminal law applies “property rules”, in the language of Calabresi and Melamed (1972), while tort law applies “liability rules”. It follows that the theory of property rules, as developed by Calabresi and Melamed as well as later writers, should provide the basis for a positive theory of criminal law. Although this is a reasonable conjecture, it has been challenged recently by critiques of the property rules framework. The most important of these modern critiques is the argument by Kaplow and Shavell (1996) that property rules and liability rules are equivalent in terms of their welfare implications (in low transaction cost settings), a thesis which Hylton refers to as the “Indifference Proposition”. Hylton uses a simple example involving an actor who has a choice to take or to purchase a bicycle to explore the welfare implications of property and liability rules in a setting where transaction costs are low. He finds that when bounded rationality, predatory behavior and defensive behavior are incorporated into the analysis, property rules are unambiguously superior to liability rules in terms of welfare effects. He concludes that the Indifference

Proposition is invalid when applied to a richer description of the low transaction cost environment – a description that incorporates predatory and defensive conduct, as well as bounded rationality. The upshot is a more complicated but sturdier defense of the property rules framework as a positive theory of the boundaries of criminal law (separating criminal law from other areas of law), and of specific criminal law doctrines.

Chapter 4 (Mikos)

In this chapter, Mikos re-examines the question of the size of the optimal sanction taking into account the differential vulnerability of different victims. Under the traditional view of law and economics theorists, the (expected) size of the criminal sanction should be equal to the size of the (expected) harm caused by the crime. If the sanction is set appropriately, the potential criminal would commit the crime if and only if the benefits to the criminal are larger than the size of the harm. It follows that only “efficient crimes”, namely crimes that benefit criminals more than they harm victims, will be committed.

Yet, Mikos reminds us, designing sanctions calibrated to achieve efficient deterrence is difficult because the harms resulting from a crime depend on the identity of the victim: some victims are particularly vulnerable while others are not. The variance in the level of harm of different victims is a challenge to the legal system; there are great difficulties in calibrating the size of the criminal sanction in accordance with the vulnerability of the particular victim. Given these difficulties, criminal law often imposes a sanction that is not sufficiently sensitive to the harm borne by the particular victim. Instead of individualizing the sanction in accordance with the resulting harm to the particular victim, criminal law uses the average harm as a basic measure.

Mikos also demonstrates that the failure to differentiate between different victims may be inefficient as it may over-deter some crimes and under-deter others. In the last part of the chapter, Mikos examines some strategies designed to ameliorate these difficulties. He concludes by arguing that investment on the part of victims in precautions can guarantee an efficient scheme of incentives. It is victims who know better than the state how vulnerable they are; consequently, their investment in precautions could ameliorate the difficulties resulting from the differential vulnerability of victims. Vulnerable victims would take more precautions while less vulnerable ones would take fewer precautions. Another desirable byproduct of the differential investment in precautions is that crime would be directed toward less vulnerable victims as they invest less in precautions.

Unfortunately, given the large externalities (both positive and negative) of precautions it is often difficult to know whether the investment in precautions is conducive to efficiency. Some investments are desirable because they may serve to differentiate between more and less vulnerable victims. Others, however, are not desirable because they are motivated by the desire to displace crime from one victim to another. Furthermore, vulnerable victims may be the precise individuals for whom it is particularly costly to invest in precautions.

Chapter 5 (Tabbach)

Mungan and Mikos examined the optimal scope of criminal law and the optimal sanction, assuming a certain fixed distribution of wealth. Distribution of wealth constrains

the type of sanctions that can be imposed on criminals, because monetary sanctions can be imposed only on those who can pay them. In this chapter, Tabbach examines the effects of the distribution of wealth on the costs of crime and law enforcement. Tabbach's model establishes that in a broad set of circumstances, progressive redistribution of resources reduces the cumulative costs of crime and law enforcement. Yet there are circumstances under which the opposite is true, namely, it is regressive redistribution that reduces the cumulative costs of crime and law enforcement. Tabbach formally specifies the circumstances under which progressive/regressive redistribution is efficient. His conclusion is that "the social desirability of wealth redistribution is contingent on a trade-off between the social costs of enforcing the law upon the poor and those costs vis-à-vis the rich."

It is generally cheaper to enforce the law with respect to the rich than with respect to the poor for two cumulative reasons. First, monetary sanctions are superior to non-monetary sanctions such as imprisonment, because they merely involve transferring money from one person to another (rather than imposing suffering on a person without benefiting anybody else). Second, monetary sanctions are limited in their size; they cannot exceed the wealth of the offender. Hence it is often the case that a monetary sanction S deters effectively those whose wealth is larger than S ("the rich") but fails to deter those whose wealth is smaller than S ("the poor").

The distribution of wealth is essential to facilitate the effective imposition of monetary sanctions. If the efficient sanction is \$1000, then redistribution – which guarantees that all offenders can pay \$1000 – reduces the costs of crime enforcement because it facilitates imposing effective monetary sanctions on the poor. If the poor's wealth is \$500 and the optimal sanction is \$1000, it is necessary to supplement the monetary sanction with a non-monetary one.

If, on the other hand, the redistribution reduces the wealth of the rich below the optimal sanction, redistribution is inefficient. At times, regressive redistribution may reduce the costs of crime enforcement. This happens when redistribution guarantees that (at least) the rich can pay the optimal fine and therefore can be effectively deterred by monetary sanctions. If the optimal fine is \$10 000 and the richest person has only \$9000, it may be efficient to transfer \$1000 to him.

While many authors have explored the optimal probability and severity of punishment where wealth varies across individuals, Tabbach is the first to consider the social desirability of wealth distribution in reducing the social costs of crime and law enforcement. Yet, as he concedes, there are many efficiency-based considerations relevant to the distribution of wealth. The solvency of offenders seems a marginal consideration; our redistributive practices would not be greatly influenced by the fact that redistribution reduces the cumulative costs of crime and crime prevention.

Chapter 6 (Miceli)

Previous chapters relied exclusively on the deterrence model. Yet even traditional sentencing theorists identify incapacitation as a major consideration. Miceli develops "the hybrid model", designed to determine the optimal length of imprisonment where imprisonment serves both to deter and to incapacitate individuals. Under the traditional deterrence theory, the optimal expected sanction could be set at a level that is sometimes

larger or smaller than the expected harm. As imprisonment is costly, it is sometimes efficient to under-deter criminals; consequently, the expected gain of criminals resulting from the crime is less than the social harms they cause. In such a case, criminals commit inefficient crimes. Miceli demonstrates that, under such circumstances, incapacitation results in longer optimal prison terms than those required by the pure deterrence theory, because longer sentences prevent offenders from committing further inefficient acts. In contrast, if it is efficient to over-deter individuals under the pure deterrence model, the expected gains for offenders who commit crimes is larger than the harms they impose. In this case, criminals may fail to commit efficient crimes. If this is the case, incapacitation considerations result in shorter optimal prison terms than those required by the pure deterrence theory. Miceli refines the model by adding the possibility of having monetary sanctions and also extending the model to address new and more complicated assumptions.

Chapter 7 (Arlen)

Previous chapters did not differentiate between different perpetrators of crime. This chapter focuses its attention on a special sub-set of perpetrators of crime – corporations – and argues that law enforcement policy should apply differently to individuals and corporations. The differences are attributable to the fact that corporate liability is not designed merely to deter crime but also to induce firms to invest in “policing” measures that increase the probability of corporate crimes being detected and sanctioned. Hence, the state must ensure that firms benefit from investing in such measures. Arlen praises the existing practice of offering leniency from prosecution to firms that fully cooperate with the state, coupled with residual sanctions imposed on such firms. In her view, such a scheme potentially enhances deterrence by increasing corporate cooperation while still providing firms with a financial incentive to prevent wrongdoing. The chapter examines the scheme governing corporate liability and evaluates its economic desirability.

Chapter 8 (Guttentag)

All previous chapters were premised on the assumption of rationality of criminals. In this chapter, Guttentag exploits behavioral and experimental research to challenge the premise that fraudulent accounting practices are rational and can be effectively deterred by using traditional economic methodology. In fact, he maintains that fraudulent accounting is “the unforeseen consequence of minor and seemingly innocuous transgressions rather than a product of planning and forethought.” This conclusion results from various behavioral findings. For instance, it was found that cheating is self-limited and situationally contingent. The frequency of cheating is not always sensitive to its expected benefits. Changes in economic incentives do not have significant effects on the propensity to commit frauds. In sum, the decision to commit frauds is not typically the product of a rational calculation.

Guttentag argues that stochastic modeling can better explain the dynamics within a firm that may lead to accounting fraud. Stochastic process models are designed to capture the case in which “observable macroscopic behavior is produced by the cumulative effects of numerous ‘microscopic’ events.”

Two types of data support Guttentag's hypothesis: psychological and sociological. Psychological data establishes that many cheaters are "honest cheaters". Such cheaters constrain the scope of their own cheating; they are inclined to limit the nature and the size of cheating. Further, changes in the potential gains resulting from cheating do not seem to have significant effect on the propensity to cheat. Sociological data indicates that circumstances in an agent's environment and the behavior and expectations of others have a great influence on the propensity to cheat.

Guttentag exploits these findings and develops models that describe mathematically the behavior of a system that undergoes a series of relatively small changes at random. These models establish the possibility that such a series of small changes may result in fraud. One interesting policy implication is that the sanction for fraud ought not depend on the motives of managers. This is because, under Guttentag's view, many accounting frauds are not motivated primarily by personal gain. Instead, managers stumble upon fraud rather than plan it in a rational manner. Although Guttentag's main interest is in examining accounting practices, his proposal may have implications concerning the use of motives in general and their relevance to criminal law and to sentencing practices.

Chapter 9 (Garoupa)

Previous chapters examined the optimal policy for combatting crime. Yet, combatting crime effectively presupposes that officials' incentives converge with the social good. Garoupa examines the set of incentives that influence prosecutors' behavior – in particular, their behavior under different institutional schemes. Under the classic model developed by Landes, prosecutors seek maximization of convictions weighted by sentences. In contrast, Garoupa suggests that American systems and European systems differ in the type of incentives provided to prosecutors and in the composition of the officials choosing to serve as officials (selection effects). Consequently, the two systems generate different behavior on the part of officials. Garoupa develops a typology of prosecutorial bodies. Some prosecutorial bodies (e.g., the American system) are "hierarchical", i.e., they have a lot of power, particularly with respect to their investigative resources and tactics; others (primarily European systems) are "coordinative", i.e., they have limited ability to influence the investigative process. The amount of control over investigative resources and tactics attracts different people to serve as prosecutors and generates different behavior on the part of prosecutors. The more powerful the prosecutor is, the more the result of the trial can be attributed to the prosecutor and, thus, the more the prosecutor is willing to take risks. Garoupa shows that evaluating the institutional environment is crucial for evaluating the efficacy of different legal systems.

Chapter 10 (Klick, MacDonald, and Stratmann)

This chapter re-examines a question that has puzzled many theorists of crimes: the dramatic reduction of crime rates in the United States in the 1990s. Numerous economists have investigated the reduction in crime rates. One of the most famous hypotheses is the controversial claim that the decline in crime rates can be explained by the legalization of abortion. Klick, MacDonald and Stratmann provide a new explanation, supported by empirical tools. They rely on the simple intuition that mobile phones provide opportuni-

ties for victims to report crimes to the police in real time and also allow bystanders to provide details of crimes at a very low cost. Mobile phones often facilitate the transmission of photographic information and help the police to locate the precise location of the victim. To establish this conjecture, this chapter provides empirical data concerning the correlation between the number of mobile phones and crime rates. The data shows that all of the violent crime measures exhibit a negative relationship with the number of mobile phones, whereas property crime rates do not exhibit such correlation. The findings of the chapter highlight the importance of private precautions against crime and their role in preventing crime, which is often overlooked.

Let us warn the readers that the law and economics of criminal law is merely one perspective relevant to evaluating criminal law practices. It is evident that citizens have strong reactions to crimes and they wish that criminal law and law enforcement policy reflect their sentiments and moral convictions. Nothing here should be understood as precluding the importance of the urge that criminal law mirrors such sentiments to some extent (subject to constitutional limitations). Criminal law is probably the field most influenced by popular sentiment. This book explores just one aspect of the complex considerations bearing on criminal law. But, as this volume establishes, even this narrow aspect is sufficiently rich to merit scholarly attention.

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