

The Economics of the Bill of Rights

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We elucidate, connect, and synthesize the literature that employs economics to study the individual rights and freedoms protected by the constitutional amendments comprising the Bill of Rights, especially as they relate to crime. Economics is uniquely suited to studying decisions involving tradeoffs, and each of the amendments requires tradeoffs. Emphasizing these tradeoffs allows us to discuss the constitutional rights in terms of “more or less,” as opposed to taking an absolutist approach. We find that the economic literature on the amendments of the Bill of Rights is vibrant and growing, and that viewing the amendments within the framework of economics is highly useful.

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1. INTRODUCTION

A bill of rights is what the people are entitled to against every government on earth ... and what no just government should refuse or rest on inference.

Thomas Jefferson, Letter to James Madison, Paris, December 20, 1787

The Bill of Rights is the name given to the first ten amendments to the Constitution of the United States. These amendments protect certain individual rights and freedoms of individuals from encroachment by government; they can be summarized as follows:

- First Amendment. Freedoms of speech, the press, and religion.
- Second Amendment. Right to keep and bear arms.
- Third Amendment. Right not to quarter troops.
- Fourth Amendment. Right against unreasonable search and seizure.
- Fifth Amendment. Rights to silence, due process, and against unjust property seizure.
- Sixth Amendment. Right to trial by jury in criminal cases.
- Seventh Amendment. Right to trial by jury in civil cases.
- Eighth Amendment. Right against excessive fines, and cruel and unusual punishment.
- Ninth Amendment. Maintenance of other rights not enumerated.
- Tenth Amendment. Retention of residual power by the states and the people.

The Bill of Rights is one of the most widely invoked parts of the United States Constitution. Coupled with the Fourteenth Amendment, which applies the Bill of Rights to the states, the first ten amendments to the Constitution became the foundation for many of the most far-reaching court decisions of the twentieth century. The courts have interpreted and applied these amendments in varying contexts and across changing social landscapes. Moreover, the amendments have shaped the development of law and policy with regard to several of the most controversial social issues of our time, including gun control, privacy invasion, and capital punishment.

There is a vast, longstanding body of literature on the legal implications of the Bill of Rights. In this paper, we connect and synthesize the small and fragmented but growing body of economic literature. It might seem surprising that economics has any relevance to the amendments. However, most of the amendments involve tradeoffs; for example, between censoring harmless or productive speech and allowing harmful speech, between disarming crime victims and arming criminals, between reducing privacy and increasing crime, or between punishing the innocent and acquitting the guilty. Since economics is the science that studies decisions involving tradeoffs, issues related to the amendments are actually economic issues.

Emphasizing the tradeoffs themselves allows us to discuss the constitutional rights in terms of “more or less,” as opposed to taking an absolutist approach. The absolutist approach, which has often been taken in legal scholarship and policy-making, is a literal reading and interpretation of the amendments. For example, the absolutist approach affords the government no right to pass any law that restricts speech since the First Amendment literally specifies that “no law” shall be passed that abridges the

freedom of speech. In contrast, under the economic approach, the government might be permitted to censure speech that is harmful if the costs to society outweigh the benefit to the individual. The economic approach weighs the interest and rights of the individual against the general welfare of society.

Since several of the rights protected by the amendments seem absolute, it may appear that there is no room for tradeoffs. However, this is incorrect. First, the statement of many of the rights indicates that there are tradeoffs. Citizens are protected from “unreasonable” searches, but the reasonableness of a search depends on the potential risks involved. Punishments should not be “cruel and unusual,” but there is no discussion of how cruel or unusual. Second, even for those rights that appear absolute, such as the right to free speech, the courts have been forced to make tradeoffs, as in the classic lack of a right to yell “Fire” in a crowded theater. However, for these rights, the right appears to set the burden of proof. That is, although rights to speech may be curtailed, the party attempting to limit the right has the burden of proof. Nonetheless, these rights are absolute only nominally; in fact, they are malleable and economics supplies a theory as to how to figure out the optimal extent of these rights.

Much of the emerging economic literature on the rights protected by the amendments employs formal economic reasoning and modeling. Several papers formulate rational choice models to analyze the efficiency of policies derived from the amendments, and others formulate econometric models to estimate the effects of these policies on observable outcomes. The results of these theoretical and econometric studies are directly relevant to current political debate and policy-making. As we inter-relate these studies for the first time, there emerges a new, rigorous, and useful field of study that could be labeled “the economics of the Bill of Rights.”

The rights protected by the First, Second, and Fourth through Eighth Amendments have received the most attention. We begin with the First Amendment freedoms of speech and of the press. Free speech means free competition in ideas. But a competitive ideas-market can fail if the ideas have negative externalities. Under an economic approach, this may warrant restrictions on speech, but such restrictions result in an enforced monopoly, abuse of which may also harm social welfare. In particular, restrictions on political speech could paralyze political competition and create a monopoly of government power, since speech is the principal means by which politicians compete. Restrictions on the freedom of the press could also limit political competition, and could even subvert democracy. If voters are not well informed about the qualities of candidates running for election or the actions of elected politicians, then the candidates may be adversely selected and the elected politicians may be corrupt. A free press may reduce the informational asymmetry, thereby reducing adverse selection and corruption.

The freedoms of speech and of the press increase political competition and government accountability, which in turn determine the extent of all other individual rights, including those protected by the other amendments. For example, several of the other amendments protect the rights of suspects and defendants in crimes. While police and prosecutors might attempt to disregard or abuse these rights, press freedom facilitates the monitoring of police and prosecutors, thereby leading to accountability and enforcement of these rights.

The Second and Fourth through Eighth Amendments concern the multiple stages of crime and punishment, and the important tradeoff between freedom and security. The right to bear arms comes into play as potential criminals and victims choose whether to obtain a gun to commit, or defend against, crime. The right against unreasonable search is at stake when the police choose whether to search suspects based on available evidence. The right against self-incrimination is at issue when suspects choose whether to remain silent during police interrogation or at trial. The right to trial by jury affects whether defendants are convicted. And the right against excessive punishment plays a role in decisions about the severity of sentencing of convicted felons, including decisions about capital punishment.

A number of papers develop economic models of crime and punishment to analyze the effects and social efficiency of these rights. Many of these models are game-theoretic models, since many of the stages of crime and punishment involve strategic interaction between decision-makers—for example, between potential victims and criminals, between criminals and the police, and between lawyers and juries. With assumptions about the objectives of the decision-makers, these models generate predictions about the effects of changes in policies concerning the amendments. With additional assumptions about the objectives of society, the models can also be used to characterize the socially optimal policies.

Other papers exploit variation across individual states in laws and court decisions concerning the amendments to econometrically test the effects of these laws and provisions on crime and law enforcement. States vary in their adoption, and the timing of their adoption, of gun control laws, police search rules, and the death penalty, which has allowed economists to estimate the impact of these provisions and policies on the incidence of crime. From time to time, the Supreme Court has generated rulings that can serve as natural experiments to observe implications of changes in laws that affect some but not all states, as when the exclusionary rule was imposed on all states or when capital punishment was first abolished and then allowed. The resulting observations are in turn useful in determining the most efficient policies.

This paper proceeds as follows. Section 2 covers the economics of freedom of speech and of the press. We cover these freedoms first because they are essential for creating and enforcing all other rights. Sections 3 through 7 cover, respectively, the right to bear arms, the right against unreasonable search, the right to silence, the right to trial by jury, and the right against excessive punishment. Essentially, these sections cover the history of a crime and its punishment—from decisions about methods used to commit or defend against a crime, to the behavior of police in seeking a criminal, to rules of trial, to punishment. So far as we are aware, this explanation for the sequence of the amendments has not been noted and may be one of the advantages of the economic approach.¹ Section 8 summarizes and proposes questions for future research.

¹ Amar (1998, pp. 36-37) offers another explanation. He argues that the order of the amendments tracks the order of comparable subjects in the original Constitution. This is plausible given that Madison initially proposed to integrate his amendments into the text of the Constitution, but it was decided instead that they would be added at the end.

Although the Bill of Rights comprises several rights that do not relate to crime, we have mainly limited our focus in this paper to rights as they relate to crime. This is primarily for reasons of space. There is an economic literature relating to other aspects of the Bill of Rights. For example, there is a large economic literature on the takings clause of the Fifth Amendment (for a detailed summary of this literature, see Miceli, 2004, and for a recent analysis, see Brennan and Boyd, 2006). Although such an extension would be useful, we do not undertake it here. We do, however, consider issues of commercial speech and civil jury trials in the Appendices.

2. FREEDOM OF SPEECH AND OF THE PRESS

Congress shall make no law ... abridging the freedom of speech, or of the press ...
First Amendment to the U.S. Constitution

2.A. Freedom of Speech

Economic analysis of freedom of speech starts with the notion of a marketplace for ideas, formally introduced by Coase (1974) and discussed by Owen (1974). Free speech is free competition in an ideas market. If an ideas market fails to produce a socially optimal outcome, intervention to regulate speech in that market might be justified. However, regulation of speech in an ideas market can lead to a monopoly on ideas, which can severely harm social welfare.

Public Goods and Negative Externalities

As discussed by Posner (2007, p. 727), Miceli (2004, p. 318), and Cooter (2002, p. 473), an important economic characteristic of much speech is that it is a public good; when an idea is put forth, anyone hearing it can use it. This means that people have inadequate incentives to produce ideas and speech. Anything that adds to the cost of speech will then have a large suppression effect, since many of the benefits of speech accrue to others anyway. This may be especially true of political speech. Political discourse and debate tend to produce better decisions for society, but individuals often have few incentives to participate, since they do not capture most of the benefits of their own participation and incur opportunity costs, as they could spend their time pursuing personal gain instead.

However, not all speech serves the public good. Some speech, such as disclosure of sensitive information during war-time or refusal to disclose information about a crime (note that silence is a form of speech), may have negative externalities. The economic approach would limit such speech if and only if its expected social benefits, which include the benefit that the speaker and others derive from it, are outweighed by its expected social costs, which include the harm that it does to others.

Consider an individual who would reveal details about troop deployment or advances in weaponry during war-time. The individual might derive a personal benefit from revealing this information, but given the possibility of advantage to the enemy, the

cost to the nation as a whole far outweighs the individual's benefit, however large that benefit might be. Therefore, it is likely to be socially efficient to restrict the disclosure of such information.

In contrast, consider a reporter who has information about an impending crime from a secret source but who refuses to disclose the source. The cost to society of the reporter's silence with respect to the identity of the source might be great, as identifying the source might help establish the credibility of the information, and locating the source might yield other information to help stop the crime. However, the reporter's benefit from not revealing his source might also be great, since revealing it would severely damage the reporter's reputation for confidentiality. More generally, forcing reporters to reveal their sources (e.g., by threatening jail time) would make people less willing to talk to reporters in the first place, which may also harm society. Therefore, it may be socially efficient to grant reporters the privilege to not reveal their sources.

Other types of speech that may have negative externalities include incitement to a crime and the desecration of a public symbol. Consider an individual who says "a riot is the only effective way to fight police injustice." This statement expresses an idea, which potentially has value. But the statement might also incite people to riot and commit crimes against others. However, as long as the speaker is not very influential, the probability that the statement will actually incite a riot is small, so the expected costs of the statement are likely to be outweighed by the value of the idea that it communicates.

Now, consider the desecration of a public symbol. Rasmusen (1998a) applies the economic approach to the question of whether flag burning, as a form of political expression, should be protected under the First Amendment. People who oppose the policies of their government might derive a benefit from burning their country's flag to communicate their discontent, but burning the flag would also impose emotional costs on people who venerate the flag and feel patriotic toward their country.

One could let dissidents and venerator bargain over the right to burn or not to burn the flag. If dissidents value that right more than venerator, dissidents could purchase the right from venerator at a price that would compensate the venerator for the costs that they would incur from the flag being burned. If venerator value the right more, they could purchase it from dissidents at a price that would compensate the dissidents for the benefits that they would have derived from burning the flag. However, this bargaining is not likely to work, since transaction costs between the two groups are high, as the issue is emotionally charged, and emotional costs are difficult to quantify. Therefore, whether the right is allocated to one group or the other is significant, and intervention is required to choose the most efficient allocation.

But is it most efficient to give the right to burn or not burn the flag to the dissidents or to the venerator? Since symbols are goods, they should have property-rights protection similar to any other goods; otherwise there will be insufficient incentive to maintain them. Typically, a large effort is required to create and maintain a public symbol, especially in the education of generations of people about its meaning. Laws against the desecration of public symbols provide protection for these symbols, which increases incentives to maintain them. One could also make the case that desecration, such as flag burning, gains an unfair advantage in the forum of ideas by upsetting

people—by using offense rather than the strength of the idea to catch attention. Thus, even apart from the offense, flag burning might crowd out other informative speech.

However, and perhaps most importantly, economic theory suggests that if flag burning is legalized, as it has been by the Supreme Court (*Texas v. Johnson*, 491 U.S. 397, 1989, and *U.S. v. Eichman*, 496 U.S. 310, 1990), then there should be less flag burning, not more. If flag burning is legalized, then it can no longer be used as a signal of commitment. Only if flag burners will be punished do their acts demonstrate how strongly they feel.

Adverse Selection and Monopolistic Screening

Breton and Wintrobe (1992) explore whether asymmetric information might justify restricting the freedom of certain types of speech. In a market for ideas, if some ideas are truer or less misleading than others, truer ideas are costlier to produce, and speakers are privately informed about the quality of their ideas, then the ideas may be adversely selected. If listeners cannot distinguish the ideas in terms of their truth-content, they may have to regard them all as containing an average proportion of truth. Purveyors of the most truthful ideas may be unsatisfied that their ideas are regarded as containing only an average proportion of truth, and may prefer to avoid the costs of generating them in the first place. This may reduce expectations for the truth-content of the ideas of the remaining speakers, causing the speakers with the next most truthful ideas to remain silent. This unraveling process may continue until only the lowest quality ideas are spoken.

In theory, restrictions on freedom of speech could reduce the adverse selection problem in ideas markets. The restrictions could be used to screen out low quality ideas and to pass on high quality ones. However, perfect screens are likely to be much too costly for society to implement, and imperfect screens are likely to screen out many good ideas along with bad ones. It may be very difficult for society to discern whether an idea is good or bad.

Moreover, restrictions on freedom of speech in an ideas market have to apply equally and consistently to all ideas in that market. In any ideas market, a given set of regulations on speech has the nature of an enforced monopoly. Therefore, there is a danger of abuse, and harm to social welfare. In particular, the monopoly restrictions could be used to excessively repress ideas. The greater the likelihood and costs associated with abuse of monopoly restrictions on freedom of speech in a particular ideas market, the less justified are restrictions on freedom of speech in that market. We now show how this analysis would apply to particular kinds of speech.

Consider speech in court. In a trial, the defense and prosecution present evidence in order to convince a jury that the truth is in their favor. Guilt or innocence is difficult to ascertain; this is the reason for a trial. Moreover, parties are likely to be better informed than the jury about the quality of their evidence, and are likely to present evidence only if it is in their favor. Therefore, the adverse selection problem is likely to be large. This may provide a rationale for the many existing restrictions on speech in court, such as those embodied in the various rules of evidence.

One such rule concerns the admissibility of character evidence. Schrag and Scotchmer (1994) show that allowing character evidence may not be efficient, because it may weaken deterrence by increasing wrongful convictions, thereby providing individuals who have committed crimes in the past with fewer incentives to abandon their criminal careers.

Although there may be good reasons for regulating speech in court through rules of evidence, these rules are an enforced monopoly since they must be applied uniformly across cases. The costs of abuse of this kind of monopoly are likely to be large. For example, a corrupt government could manipulate or change the rules of evidence to facilitate conviction of defendants who may have interfered with the government's possibly corrupt objectives. Perhaps in part to guard against this kind of abuse, several other regulations on speech in court are embodied in the Constitution as basic rights of defendants. For example, the Fifth Amendment's clause against self-incrimination is interpreted as forbidding the prosecutor from commenting on a defendant's failure to testify in court.

Consider instead scientific or academic speech. The validity of scientific ideas may be difficult to ascertain, even though experimentation is possible. The adverse selection problem may therefore be large. For this reason, scientists adopt paradigms that sort truth from error. An example is the rational choice paradigm in economics. But a paradigm is an imperfect screen, and an enforced monopoly. To the extent that abuse of the power of a paradigm is costly to the progress of a field, original ideas developed outside the paradigm might need protection.

Consider now political speech. It is very costly to experiment with political ideas, so the adverse selection problem is likely to be prevalent in political speech markets. However, restrictions on political speech would constitute an enforced monopoly, abuse of which is highly likely and could entail costs that would easily outweigh all other considerations. Political parties in power have a natural incentive to restrict the speech of their political rivals, since this could ensure that they remain in power. Lott (2006) provides empirical evidence that restrictions on campaign finance, which restrict political speech and, in particular, campaign advertising, create a benefit to incumbent politicians. Campaign donation limits significantly reduce the number of candidates running for election, and increase the probability that incumbents win re-election.

Political speech is the only means of competition for rival political parties, other than violence. Restrictions on political speech might therefore directly inhibit competition within the political process, or increase the use of violence for political competition. Political competition in turn determines regulations in almost every other market, including goods and ideas markets. Restrictions on political speech could therefore produce an enforced monopoly in all markets, abuse of which would entail enormous costs. This may explain why the First Amendment's free speech clause has been interpreted as protecting mainly the freedom of political speech.²

² Although the First Amendment refers to "speech" without any qualifier, courts have long distinguished between political and commercial speech, and have provided less protection to commercial speech, including advertising. In Appendix I, we examine the economic arguments concerning restrictions on commercial speech.

2.B. Freedom of the Press

The First Amendment also protects freedom of the press, which may operate to reduce informational asymmetry between participants in various markets that are covered by the press, including ideas markets. If the press can freely investigate the ideas produced as a result of freedom of speech, the validity of these ideas may be more likely to become apparent. The ideas would then be less adversely selected. Freedom of speech, then, would lead to a more efficient outcome. Thus freedom of the press might improve the efficiency of the marketplace for ideas.

Freedom of the press can also be independently justified on the grounds that it solves information problems in political competition and increases government accountability.

Adverse Selection and Moral Hazard

Brennan (1995) uses game theory to argue that the First Amendment's guarantee of a free press can be justified on efficiency grounds because it solves adverse selection and moral hazard problems in political competition. Politicians vary in their quality. Some are more honest and more committed to serve the public than others. If voters are not well informed about the quality of political candidates, only the lowest quality candidates may be expected to run for office. That is, political candidates (like ideas and goods) may be adversely selected. If voters cannot distinguish candidates in terms of honesty, they tend to regard them all as equally dishonest. Such a blanket characterization may impact honest candidates more than dishonest ones. The most honest candidates may then decide not to run for office, reducing voter regard for remaining candidates, leading the next most honest ones not to run, and so on until only the most dishonest candidates run for office.

Caselli and Morelli (2004) develop a formal model of the quality of politicians, in which politicians are adversely selected in equilibrium. In the model, candidates differ in their competence as well as in their honesty. Adverse selection of candidates can occur because more competent candidates have higher opportunity costs of running for office, and because more honest candidates have lower expected gains from holding office. The model further implies that the less informed are the voters, the more adversely selected are the candidates since the less informed voters are, the smaller is the probability of election for honest and competent candidates.

The expected gains from office are higher for dishonest politicians to the extent that voters remain ill informed about the actions of such politicians after they are elected to office. If the actions of elected politicians remain hidden from voters, politicians face a moral hazard. They may have incentive to benefit themselves, for example by taking bribes, rather than act on behalf of the public. Honest politicians cannot credibly signal to voters that they are honest, since dishonest politicians can send the same signals. Thus, if voters are not well informed about the quality of politicians, it should be expected that dishonest politicians will run for election and that politicians will be dishonest once they

are elected.

This outcome, in which most politicians are dishonest and voters distrust most politicians, might be avoided through a credible commitment to allow media to freely inform voters about the quality of politicians and about their actions while in office. With freedom of the press, voters could have access to information about politicians' degree of commitment to serving the public. This could allow honest candidates to credibly signal their honesty to voters. Voters might then afford them the higher regard that might encourage them to run for office. With more honest candidates running for office, voter regard for candidates might then increase, which might prompt candidates who are even more honest to run for office, and so on, until many of the best candidates may be expected to run for office.

With freedom of the press, voters could also have access to information about the actions that politicians take while serving in office, which would reduce the expected gains from office for dishonest politicians. Voters could also have access to information correlated with the degree of competence of politicians, which would reduce the probability of election of incompetent politicians. This would reduce the adverse selection problem still further. Moreover, with such a commitment in place, politicians could not abuse their power for personal gain. Voters in turn could trust elected politicians not to abuse their power. Politicians would no longer face a moral hazard problem and might then enjoy greater trust and be given greater autonomy by the public, which may in turn allow them to govern more effectively.

Evidence on Press Freedom and Corruption

Press freedom might reduce corruption and increase trust in government because it allows the most competent and honest politicians to be elected and commits elected politicians to serving the public. Brunetti and Weder (2003), Adsera, Boix, and Payne (2003), and Chowdhury (2004) empirically investigate the effects of press freedom on aggregate measures of corruption across countries. Corruption is obviously difficult to measure because it is hidden. The studies use *International Country Risk Guide* and *Transparency International's* indicators, which are based on surveys of country experts, business people, academics, and risk analysts. The results of these studies generally indicate that freedom of the press significantly reduces corruption, but each study interprets its results with caution, since corruption may also affect press freedom. One form of corruption is bribery of the press. McMillan and Zoido (2004) present striking evidence of this form of corruption in the 1990s in Peru, which was run by the chief of the secret police, Vladimiro Montesinos Torres, in the name of President Alberto Fujimori. Montesinos regularly bribed media outlets, and even kept written receipts for his bribes, and videotapes of the transactions, to use as evidence of complicity to prevent an outlet from later denouncing him. When Fujimori's government fell, the receipts and videotapes were seized and broadcast. In one videotape, Montesinos is seen paying 1.5 million U.S. dollars to Jose Francisco Croussillat, vice president of *America Television*, Channel 4.

Besley and Prat (2006) analyze media capture in a theoretical model. Media outlets observe a common signal of an incumbent politician's quality; the incumbent observes the media's signal and chooses a bribe offer for each media outlet; media outlets choose whether to accept the incumbent's bribe offer; and voters observe a signal about the incumbent's quality as reported by a media outlet, and choose whether to vote for the incumbent. Equilibrium media capture is shown to decrease with the number of media outlets. The incumbent that generates a bad signal only makes bribe offers if it knows that all media outlets will accept his offers, because if even one outlet is not silenced, the bad signal reaches voters. But given that the incumbent silences all media outlets, any one outlet's profit from not accepting the bribe is the profit that it would earn if it were the only provider of media in that market. Thus, the incumbent must pay every media outlet the profit that the outlet would earn if it had a monopoly in that market, no matter how many outlets are actually in the market. As the number of media outlets grows, silencing all outlets quickly becomes prohibitively expensive. For this reason, press freedom should increase as the media become less concentrated. Using cross-country evidence, Besley and Prat find that more concentration in newspaper ownership is indeed associated with less press freedom, and less press freedom is in turn associated with more corruption.

2.C. Mother of All Rights

Freedom of the press and freedom of political speech are essential for creating and enforcing other rights. If government violates a right but no one can learn of the violation, then there is no cost to the government for the violation. Moreover, if the government can restrict the speech of political rivals, then it can maintain a monopoly on government power. The freedoms of political speech and of the press increase political competition and government accountability, which in turn determine the extent of all other individual rights, including those protected by the other amendments of the Bill of Rights.

Several of the other amendments of the Bill of Rights protect the rights of suspects and defendants in criminal cases. Freedom of the press can serve to discipline corrupt, incompetent, or politically motivated prosecutors and police who might be prone to abusing the rights of suspects and defendants. We are not aware of any formal literature on this issue. However, there are numerous anecdotes. An anecdotal discussion by a journalist who has built a reputation on and won a Pulitzer Prize for exposing political misuse of the prosecutorial office is Rabinowitz (2004). In this book, Rabinowitz exposed the false sexual abuse charges filed against the operators of day care centers and other individuals, and particularly the charges against a family named Amirault in Malden, Massachusetts. Many of the individuals discussed by Rabinowitz had been sentenced to prison and were serving terms based on excess zeal by police and prosecutors. In many cases, her writing led to their release. The role of the press in monitoring law enforcement officials is an important topic that is worthy of further research.

Most of the rights protected by the other amendments of the Bill of Rights are

related to crime and punishment, and potentially involve an important tradeoff between freedom and security. To determine the proper extent of these rights, society must understand their tradeoff effects with regard to security and freedom. Economic models of crime and punishment can be employed to evaluate the direction and magnitude of these effects.

3. THE RIGHT TO BEAR ARMS

A well regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms, shall not be infringed.

Second Amendment to the U.S. Constitution

In the first stage of crime and punishment, citizens choose whether to commit a crime, and what measures to take to defend against crime. In particular, citizens might want to arm themselves to commit, or to defend against, crime. The Second Amendment protects the right to bear arms; though it is not clear from the wording of the Amendment whether it protects an individual's right to carry arms or only a state's right to maintain a militia. While the original purpose of this Amendment may have been to protect citizens from the government itself (by maintaining the power to resist tyranny), the right also affects crime. Indeed, in current debates, the relation to crime is the main issue discussed.

The individual's right to carry guns has been the subject of intense debate and litigation. At the heart of the debate is an important tradeoff between arming criminals and disarming potential victims. Gun-control advocates argue that guns have a "facilitating effect" on crime, because they are often lost or stolen, and resold to criminals through underground markets. Gun rights advocates argue that guns have a "deterrent effect" on crime, because criminals are less likely to attack if they fear an armed response from potential victims. Gun control might take guns out of the hands of criminals, reducing the facilitating effect, but might also take them out of the hands of victims, reducing the deterrent effect.

Deterrent and Facilitating Effects

Economic theory can be employed to predict the overall effect of gun control on crime. Taylor (1995) analyzes a model in which potential criminals and victims are randomly pair-wise matched, and criminals choose whether or not to attack victims, an action that is assumed to require a gun, while victims choose whether to carry a gun for protection. Gun control is assumed to increase the cost of carrying a gun for criminals and victims alike.

In the model, if victims carried a gun, criminals would not want to attack, fearing an armed response; if criminals did not attack, victims would not carry a gun, because it is costly and carries a risk of accident; if victims did not carry a gun, criminals would attack, because of the ease of succeeding in the crime; if criminals attacked, victims would carry a gun, and so on. Best responses cycle, so the model does not have an equilibrium in which criminals or victims choose an action with certainty. The

equilibrium must then involve randomization. But to be willing to randomize between their actions, criminals and victims must be indifferent between them. Thus, in the equilibrium, victims carry a gun with a probability that makes criminals indifferent between attacking and not attacking, and criminals attack with a probability that makes victims indifferent between carrying and not carrying a gun.

In this model, a marginal increase in gun control increases crime. It reduces the victim's incentive to carry a gun, so criminals attack with higher probability until the victim's indifference between carrying and not carrying a gun is restored; and it reduces the criminal's incentive to attack, so victims carry a gun with lower probability until the criminal's indifference between attacking and not attacking is restored. A marginal increase in gun control leads victims to carry a gun less often, and leads criminals to attack more often, and therefore increases completed crime, reinforcing the old adage "If guns are outlawed, only outlaws will have guns."

However, this result does not hold in a more realistic environment in which criminals can also attack without possessing a gun, and victims can also take other precautions to avoid being attacked. Mialon and Wiseman (2005) analyze a model in which criminals choose between not attacking, attacking without a gun, or attacking with a gun, while victims choose between not carrying a gun, carrying a gun for self-defense, or taking alternative prevention measures, such as lying low by staying home at night or avoiding certain places or situations. Lying low entails a cost, which represents the loss of freedom. Carrying a gun also entails a cost, which includes the risk of legal punishment prescribed by gun control policy. Initially, gun control is again assumed to increase the cost of carrying a gun for both criminals and victims.

In the model, if victims did not carry a gun, criminals would attack with a gun, because of the great advantage it would confer over victims; if criminals attacked with a gun, victims would lie low, to avoid either an armed confrontation or immediately losing their endowment to an armed criminal; if victims chose to lie low, criminals would not carry a gun, because of the risk of legal punishment; if criminals did not carry a gun, victims would carry a gun, because of the great advantage it would confer over criminals; if victims carried a gun, criminals would not attack; if criminals did not attack, victims would not carry a gun; and so on. Again, the best responses cycle, and the equilibrium requires randomization over all actions by both criminals and victims. Victims carry a gun and lie low with probabilities that make criminals indifferent between not attacking, attacking with a gun, and attacking without a gun; and criminals attack without a gun, and attack with a gun, with probabilities that make victims indifferent between not carrying a gun, carrying a gun, and lying low.

In this model, a marginal increase in gun control reduces gun crime, although it also increases non-gun crime. It reduces criminals' incentives to commit gun crime and increases their incentives to commit non-gun crime, leading victims to reduce their lying low and to increase their gun carrying until criminals' indifference is restored; and it reduces victims' incentives to carry a gun and increases their incentives to lie low, such that criminals commit less gun crime and more non-gun crime until victims' indifference is restored. Marginal gun control leads victims to carry a gun more often, and leads criminals to attack with a gun less often, so it reduces gun crime and leads victims to lie

low less often, which increases their freedom; but it also leads criminals to attack without a gun more often, so it increases non-gun crime. However, marginal gun control may be socially beneficial overall, because gun crime is costlier than non-gun crime, and the freedom of potential victims is important to social welfare.

In contrast, full gun control, in the form of an absolute prohibition on gun carrying, completely disarms both criminals and victims. Victims then choose between lying low, on one hand, and not lying low but being without defense, on the other hand. Criminals choose between attacking without a gun, and not attacking. By attacking an unarmed victim, the criminal is not likely to be severely hurt and still has a chance of winning the unarmed confrontation. The criminal's chance of winning an unarmed confrontation could even be quite high given a first-mover advantage and the ability to choose weak targets such as small persons, women, or the elderly. If the values of victims' endowments are sufficiently high, criminals would attack even though they do not have guns, leading victims to lie low to avoid losing their endowments. Full gun control then leads to an equilibrium in which there is no completed crime but victims always lie low, and therefore suffer a large loss of freedom. This result suggests that some right to bear arms is fundamental to individual freedom.

A policy that substantially increases the cost of carrying a gun for both criminals and victims eliminates crime, but also reduces the freedom of potential victims. In contrast, a policy that substantially increases the cost of carrying a gun for criminals, but not for potential victims, eliminates gun crime, while preserving the freedom of potential victims, and therefore generates the socially optimal outcome in the model. It prevents criminals from using guns, but preserves the threat of an armed response by victims, so potential victims never lie low.

Helsley and O'Sullivan (2001) propose a refundable deposit policy to encourage law-abiding gun owners to protect their guns from being stolen and ending up in the hands of criminals by making the owners internalize the social cost of losing their guns. The government would impose a refundable deposit on each gun purchased. At the end of a prescribed period of time, owners would have to establish that the gun is still in their possession or forfeit the deposit. Owners who no longer want a gun could recover the deposit by selling the gun through legal channels. The policy would allow citizens to own guns for self-defense while making it harder for criminals to obtain guns illegally. Similarly, criminal background checks before gun sales and sentence enhancements for crimes committed with a gun might increase the cost of carrying a gun for criminals without affecting it much for law-abiding citizens. According to theory, these may be the kinds of policies that could lead to the socially optimal outcome.

Equalizing Effect

So far, we have focused on the interaction between criminals and victims. However, criminals also fight amongst each other. For example, rival street gangs fight over territory for, and profits from, drug distribution. To analyze the effects of guns on gang violence, Donohue and Levitt (1998) construct a contest model in which two criminals choose whether or not to fight each other for a prize. Each criminal's

probability of winning the fight depends positively on his own fighting ability and negatively on his rival's ability. Each criminal's fighting ability has an observable and an unobservable component. The ratio of the variances of the unobservable components of the fighting abilities of each of the two criminals is a measure of the unpredictability of the outcome if the two criminals choose to fight.

In the model, the equilibrium probability and expected costs of fighting increase with the unpredictability of the fight. Guns increase the unpredictability of fights. If guns are not available, the fight outcome depends more on observable characteristics, such as the relative physical size or fighting record of the rivals. In this scenario, fighting does not occur often since the visibly weaker criminal will not be willing to fight. However, with guns, the outcome of the fight depends more on unobservable factors, such as respect for life and disutility from prison. Guns have an "equalizing effect" and thus increase the unpredictability of fights, which in turn leads to more fighting. For this reason, guns should unambiguously increase gang violence.

Evidence on Guns and Crime

The empirical literature on the effects of guns on crime began with Lott and Mustard (1997); see also Lott (2000). Lott and Mustard examine the effects of "shall-issue" laws—laws mandating the issuance of permits to carry concealed weapons for most adult non-felons requesting such licenses—on crime rates. They used a comprehensive panel data set of all counties in the U.S. from 1977 to 1992. (Lott and Mustard have made this data set generally available, and it is the basis for many other empirical studies about crime, including many of the studies discussed below.) In the initial study, the authors found that allowing easy issuance of gun licenses led to very large reductions in crime. For example, "If those states without right-to-carry concealed gun provisions had adopted them in 1992, county- and state-level data indicate that approximately 1,500 murders would have been avoided yearly. Similarly, we predict that rapes would have declined by over 4,000, robbery by over 11,000, and aggravated assaults by over 60,000" (p. 1). In other words, they find that the "deterrent effect" of guns greatly outweighed the "facilitating effect" and "equalizing effect."

This paper has been highly controversial and there are many studies in the literature examining these results. Some scholars have agreed with the Lott-Mustard results. Others have disagreed. For example, Dezhbakhsh and Rubin (1998, 2003) find that when the Lott-Mustard coefficients for states that allow shall-issue laws are plugged into the data for states that do not allow the laws, the effects on crime are small and ambiguous; some crimes in some states increase and some crimes in other states decrease.

Ayres and Donohue (1999) argue that the Lott-Mustard results can also be explained by other factors such as the crack epidemic. During the late 1980s and early 1990s, violent crime rose significantly in areas where the crack trade proliferated. The Lott and Mustard study (and indeed most other studies on the effects of shall-issue laws) did not control for the extent of the local crack trade in estimating the effect of shall-issue laws on crime. Lott and Mustard's estimates might, then, suffer from omitted variable

bias. The states that adopted shall-issue laws have tended to be Republican states with high NRA membership and low crime—not the kind of states where the crack trade tended to proliferate. On the other hand, the states that shunned the shall-issue laws might have been those states where the crack trade proliferated. The crack epidemic might have increased crime less in states that adopted shall-issue laws than in states that did not. If this is the case, then the relatively lower crime levels observed by Lott and Mustard in those states that adopted shall-issue laws might be due to the proliferation of the crack trade rather than the adoption of shall-issue laws.

As of now, the weight of evidence is against the Lott-Mustard hypothesis, but further testing is still useful. Testing the effect of guns on gang-related crime in particular, and the effect on crime of sentence enhancements for crimes committed with a gun, might yield clearer results as theory predicts the former effect to be positive, and the latter effect to be negative.

4. THE RIGHT AGAINST UNREASONABLE SEARCHES

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation...

Fourth Amendment to the U.S. Constitution

In the second stage of crime and punishment, after citizens have chosen whether and how to commit and defend against crime, evidence about whether citizens have committed crime is generated, and the police choose whether to search citizens based on this evidence. The Fourth Amendment protects the right against “unreasonable” searches, or searches without probable cause. The legal definition of probable cause was formulated in *Brinegar v. United States* (338 U.S. 160, 1949): “Probable cause, such as may justify a search ... without warrant, is a reasonable ground for belief of guilt; and this means less than evidence which would justify conviction.”

In practice, the Fourth Amendment’s protection against unreasonable searches is enforced either through an *ex ante* warrant requirement or an *ex post* remedy such as the “exclusionary rule.” In some cases, the police are required to obtain a warrant from a judge before performing a search. However, in many cases, such a requirement is not feasible; for example, when the evidence is “evanescent” or the police are in “hot pursuit.” In such cases, Fourth Amendment protections are enforced through the exclusionary rule. If the police are found to have conducted a search without probable cause, then in principle any evidence found in the search cannot be used in court, and the evidence is excluded, or “thrown out.”³ The exclusionary rule is the result of two

³ As discussed by Kontorovich (2005), any individual entitlement in the Constitution can be protected either through a process that must occur before the taking of the entitlement, in which case one might say that a “property rule” is created, or through a process that can be had after the taking of the entitlement, in which case a “liability rule” is created. Kontorovich shows that liability rules are superior to property rules in protecting Constitutional rights when transaction costs are high, and locates liability rules in the rules protecting many of the Constitutional rights, including the Fourth Amendment’s right against unreasonable searches and the Fifth Amendment’s right to silence.

constitutional rulings. In *Weeks v. United States* (232 U.S. 383, 1914), the Supreme Court held that illegally obtained evidence could not be used in prosecutions of federal crimes. In *Mapp v. Ohio* (367 U.S. 643, 1961), the Court ruled that this rule also applied to state crimes.

Since *Mapp*, the courts have established numerous exceptions to the rule, including the impeachment exception (when the evidence obtained through an unlawful search is used to impeach the defendant's testimony), the independent source exception (when the evidence is obtained from a source unrelated to the crime), the inevitable discovery exception (when "normal" police investigation would have "inevitably" led to the evidence), and the good faith exception (when police had reason to believe their search was legal), among others. Moreover, even in cases where no exception applies, the rule is not always enforced. A court might not learn whether the police had probable cause when they carried out a search. If the police searched without probable cause, they might attempt to conceal this fact to prevent the resulting evidence from being thrown out. The strength of the exclusionary rule also depends on the efforts to enforce it, which may include monitoring and disciplining police officers.

Fourth Amendment protections, through the warrant requirement or the exclusionary rule, can involve an important tradeoff between security and privacy. They make it harder for the police to search, which might increase individual privacy, but they might also increase crime. Economic research on the Fourth Amendment has focused mainly on the exclusionary rule, and has theoretically and empirically analyzed the effects of the rule on crime and privacy.

Exclusionary Rule and Crime

In theory, a weakening of the exclusionary rule would reduce crime, because it would increase the expected punishment for committing crime. If individuals commit crime, the evidence against them might rightfully indicate that they are guilty. If the police were to come across the evidence, the individuals would then be searched with probable cause, and likely convicted. But the evidence against them might also (wrongfully) indicate that they are innocent. In this case, the police might not have probable cause to search them. If the police searched them anyway, thereby finding evidence of their guilt, then they would likely escape conviction only if this evidence were excluded from trial; that is, only if the exclusionary rule were strictly enforced. Thus, a weakening of the exclusionary rule would increase the expected cost of committing crime, and therefore reduce crime.

Allowing police to search with fewer constraints would also allow them to stop more crimes before they actually occur, thereby reducing crime even further. Additionally, if criminals know that they are subject to search they might change their behavior in ways that lead to a reduction in crime. For example, criminals might be less willing to use tools associated with crime (lock picks, illegal guns) if these tools can be found in a search and used as evidence against them at trial. Similarly, if it is easier for security officials to perform electronic searches (of e-mail or computers), this might disrupt communication between members of criminal gangs, and again reduce the value

of harmful activities to potential criminals, and so perhaps, then, the amount of crime as well. For criminals, easier searches would reduce the incentive to retain unique stolen goods which could be found and identified, thereby creating incentives not to steal such goods or sell (“fence”) them sooner, again reducing the value of crime to criminals.

The theoretical prediction that weakening the exclusionary rule reduces crime can be tested empirically. Several studies have found that very few cases are thrown out because of violations of the requirements for search (for example, see Oaks, 1970, and Cannon, 1973). These findings led many scholars and policy makers to erroneously conclude that the exclusionary rule had little impact on crime rates. However, once the courts enunciate the rule and the police learn the details of the rule, we would expect them not to violate the rule because they know that its violation will lead to losing the case. Instead, they will adapt by using methods other than searches to find criminals. For example, police might rely more heavily on informants or surveillance and less on searches. But if searches are in some circumstances more efficient, having to turn to substitute alternative methods will lead to lower arrest and conviction rates, and this will in turn lead to higher crime rates.

In fact, this is exactly what has been found. Employing statistical or econometric techniques, Atkins and Rubin (2003) find that crime increased after 1961, the year that *Mapp* was decided, and that the increase cannot be attributed to other factors that might also affect crime, such as demographic characteristics or economic conditions. It so happens that before *Mapp*, exactly one-half of the states already enforced their own exclusionary rules, and one-half did not. This provided a nice laboratory for testing the effects of *Mapp*. The 1961 ruling caused an increase in most types of crime: 3.9 percent for larceny, 4.4 percent for auto theft, 6.3 percent for burglary, 7.7 percent for robbery, and 18 percent for assault. Since a strengthening of the exclusionary rule caused an increase in crime, a weakening of the rule should have the effect of reducing crime by some amount.

An issue of current interest is the extent that terrorists or suspected terrorists should be granted constitutional protections, including Fourth Amendment rights. It is difficult to make predictions about the impact on terrorism, because sufficient data on terrorist acts in the United States are not available. One might expect terrorism to be less responsive to changes in expected punishments, as terrorist acts are often driven by strong hatred of enemies or love of country or religion. Moreover, terrorism is harder to prevent, since most terrorists are part of highly organized groups that provide them with the training and means to evade government authorities, although leaders of such groups may be more easily deterred than the front-line terrorists themselves. On the other hand, if terrorists must communicate with each other or if they use explosives or other equipment, then searches might be more disruptive to terrorists than to non-terrorist criminals. For example, Landes (1978) finds that the use of metal detectors at airports has led to dramatically fewer airline hijackings. According to his estimates, if mandatory screening had not been instituted, then between 41 and 67 additional hijackings would have taken place between 1973 and 1976.

The evidence indicates that levels of security are directly responsive to rules regarding searches: if more restrictions are imposed on the police in searching, law

enforcement becomes less efficient and levels of crime increase. Weakening the exclusionary rule should therefore lead to reductions in crime, and possibly to fewer incidents of terrorism as well.

Exclusionary Rule and Searches

A weakening of the exclusionary rule might also have the effect of reducing individual privacy. A reduction in Fourth Amendment protections results in a greater invasion of privacy to the extent that it increases police searches of suspects when the evidence does not provide probable cause. Theoretically, as explained in Mialon and Mialon (2008), a weakening of the exclusionary rule should directly *increase* police searches that lack probable cause by reducing the probability that these searches will be thrown out at or before trial. However, it should also *reduce* police searches without probable cause indirectly by reducing crime. As explained above, a weakening of the exclusionary rule reduces crime, so that for any given intensity of search by police, the police would be searching more innocent citizens. Police should then respond by reducing their intensity of search. Hence, the effect of the exclusionary rule on police searches is theoretically ambiguous, as is its effect on police searches of innocent suspects. If a weakening of the exclusionary rule strongly reduces crime, it may only weakly increase or even decrease police searches, causing only a minor threat to or even an increase in individual privacy. However, if weakening the exclusionary only weakly reduces crime, it might strongly increase police searches, causing a major threat to individual privacy.

Oaks (1970) finds that the Fourth Amendment's exclusionary rule had no significant effect whatsoever on arrests by the police in Cincinnati. Cannon (1973) replicated Oaks' research in 13 other cities and showed that the effect of the exclusionary rule in Cincinnati was atypical. In Baltimore, for example, the number of arrests for stolen property and narcotics fell by almost 45 percent from 1960 (one year before the exclusionary rule) to 1962 (one year after), and remained at the lower level for several years after that. In Buffalo, stolen property and narcotics arrests fell by about 30 percent. There were no significant changes in the rates of these types of arrests in Atlanta or New York (as well as Cincinnati). However, Cannon (as well as Oaks) did not control for other factors that may also have been responsible for changes in arrest levels.

Several researchers have used interviews with individual officers and field observation to analyze the impact of the exclusionary rule on police behavior. The results of these studies are also mixed. Orfield (1987) finds that the exclusionary rule has caused police officers from the Narcotics Section of the Chicago police department to use warrants more often and to exercise more care when conducting searches without warrants. Gould and Mastrofski (2004) review reports from trained field observers who accompanied police officers from a major metropolitan police department on 115 searches. They find that 30 percent of the searches were in clear violation of Fourth Amendment prohibitions, and most of these illegal searches did not result in arrest and were therefore invisible to the courts. Police searches for drugs were most likely to result in illegal searches; one explanation is that the possession of drugs is highly correlated

with the possession of illegal weapons. If police search vehicles without probable cause and find drugs and guns, then even though their search may not result in a conviction for drug possession, since the search violated the Fourth Amendment, police can nevertheless seize the guns.

The extant empirical research neither proves nor disproves the inhibitory effect of the exclusionary rule on police searches. Moreover, theory suggests that crime and police search are simultaneously interdependent, and that the exclusionary rule directly reduces illegal searches, but also indirectly increases illegal searches by directly increasing crime. The existing empirical studies have not addressed the simultaneity of crime and police search, and have not accounted for the indirect effect of the exclusionary rule on police searches through its direct effect on crime. The results of these studies may therefore be statistically biased.

The effect on searches of weakening the exclusionary rule is theoretically ambiguous, as explained above. However, as shown by Mialon and Mialon (2008), weakening the exclusionary rule is more likely to reduce searches that lack probable cause the more accountable the police are for their mistakes, in the sense that the police suffer a greater loss if they search people who turn out to be innocent. Greater police accountability increases the indirect effect on searches of a weakening of the exclusionary rule. A weakening of the exclusionary rule reduces crime, and the police respond by reducing searches, but by a greater extent if they have to suffer greater losses from searching the innocent. If the police are sufficiently accountable for their mistakes, the indirect effect on searches of a weakening of the exclusionary rule may dominate its direct effect, in which case a weakening of the exclusionary rule would actually reduce searches.

The police can be made accountable through the democratic system and the legal system. With First Amendment rights, if innocent people are searched or arrested by the police, then they can protest, which might reduce police reputation, and put pressure on elected officials to discipline police departments in order to be re-elected. As discussed in Posner (1981), the police can also be made legally liable for damages if they search or arrest innocent people. In fact, there are many suits against the police for illegal searches. Such tort liability makes the police directly accountable to the public for their mistakes.

Police accountability increases crime, like the exclusionary rule; but interestingly, it always reduces illegal searches, unlike the exclusionary rule. An increase in police accountability directly reduces the police's expected payoff from searching, which directly reduces searches, but it does not directly increase the criminal's expected payoff from committing crime, so that it does not indirectly increase searches by directly increasing crime. That is, police accountability does not have an indirect effect on searches. In contrast, a strengthening of the exclusionary rule directly reduces the expected payoff of search, which tends to reduce searches, but also directly increases the expected payoff of crime, so that it also tends to indirectly increase searches by directly increasing crime.

This suggests that an increase in privacy is more likely to be achieved by increasing police accountability than by strengthening the exclusionary rule. While the exclusionary rule has an ambiguous effect on wrongful searches, police accountability unambiguously reduces wrongful searches, thereby protecting privacy. On the other hand, an increase in security is better achieved by weakening the exclusionary rule than

by reducing police accountability. Weakening the exclusionary rule reduces crime, and although it directly tends to increase police searches, it also indirectly tends to reduce them by reducing crime. In contrast, reducing police accountability reduces crime but always increases police searches. Thus, weakening the exclusionary rule could reduce crime with a lesser sacrifice of privacy.

Value of Privacy

Most of the debate surrounding Fourth Amendment protections implicitly assumes that privacy is highly valuable. Posner (1981, 1983), Stigler (1980), and Hirshleifer (1980) discuss reasons why people value their privacy. Privacy may be interpreted as the ability to conceal personal information that others might use to one's disadvantage. Concealment protects reputation, which is often a valuable asset in relationships. If citizens are searched by police and the details of that search are subsequently made public, they may suffer a loss of reputation, which might result in the loss of a job or a spouse. Society may therefore want to limit the government's ability to obtain, retain and disseminate discrediting personal information. For these reasons, if a weakening of Fourth Amendment protections does indeed increase police searches, then the resulting invasion of individual privacy may be socially costly.

On the other hand, when information is concealed, people may be interacting with others on a fraudulent basis, and such interactions could be costly to society as a whole. While those who have performed harmful acts may wish to keep information about such acts private, it is not clear that such concealment is socially desirable. An additional reason people may desire privacy is fear of identity theft. In that sense, privacy is a form of security. But easier searches might actually reduce the danger of this form of crime. For example, if police can more easily search the computers of suspected identity thieves, they can perhaps reduce the incidence of identity theft, and so actually increase the security component of privacy for innocent citizens.

An increase in privacy generally means a reduction in the use of information. But information itself is valuable, and if the use of information is increased, there is often social value created (Rubin and Lenard, 2002). For example, easy and quick credit checks are now possible; in many circumstances a buyer of a car, for example, is able to obtain credit on the spot. Additionally, privately held information can be used to provide security, as when child molesters are identified through use of information and denied jobs involving children, or when those with criminal records are identified and denied jobs in security. Thus, the effects of privacy on security are themselves ambiguous.

Rights, Crime, and Terrorism

In normal times, the downside of reduced security is increased crime. The social decision that has to be made is a decision regarding the proper tradeoff: what level of increased crime is worth some level of reduced rights? The results of such a decision then reflect the implicit tradeoff. However, some might argue that we do not now live in "normal" times. Laws balancing levels of rights and security must now consider terrorism

as well as crime. Thus, while the value of protected rights is presumably not affected by the possibility of terrorism, the value of security has increased because of this possibility. For example, Ted Bundy, a notorious serial killer, confessed to 28 murders. The events of September 11 led to 3000 deaths. Routine homicide bombings in Israel and Iraq often kill 20-50 people. Thus, risks of any one act of terrorism are much greater than the risks of any one act of crime. Moreover, possibilities of huge harms from “weapons of mass destruction” may be quite real. This may mean that society must rationally put more value on security now than previously (Mueller, 2004). That is, the terms of the tradeoff between rights and security may have changed, and the appropriate response may be for the scope of the rights guaranteed in the Constitution to change as well.

In its war on terrorism and crime in general, the U.S. government has weakened Fourth Amendment protections against police invasions of privacy, and reduced the scope of other rights as well. For example, the USA PATRIOT Act (Public Law 107-56), which was passed by Congress shortly after the September 11, 2001 terrorist attacks, allows the government to obtain warrants to monitor and search suspects without meeting previous standards of probable cause, in any criminal investigation, whether related to terrorism or not. The Act also allows greater information sharing between police and counter-terrorism officials. As a result, some searches that would have been unreasonable before September 11 are now “reasonable” and some information will be shared by various law enforcement agencies that otherwise would not have been shared. By weakening Fourth Amendment rights, the Patriot Act could increase security against crime and terrorism, but could also reduce individual liberty and privacy. The most complete discussion of these issues in a legal context heavily weighted by economics is Posner (2006).

5. THE RIGHT TO SILENCE AND TO DUE PROCESS OF LAW

No person shall ... be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law ...

Fifth Amendment to the U.S. Constitution

In the third stage of crime and punishment, after police have chosen whether to search and arrest citizens, citizens who are arrested must choose whether to disclose possibly incriminating evidence to police and prosecutors before and at trial, and police and prosecutors must choose what information to disclose to these citizens and their attorneys. The Fifth Amendment protects the right against self-incrimination and the right to due process of law. The clause against self-incrimination implies that a suspect or defendant in a criminal case has a right to remain silent before or at trial. The right to silence would be limited if the court or jury were allowed to draw an adverse inference from a defendant’s silence. The Supreme Court has held that the Fifth Amendment prohibits any comment by the prosecution on a defendant’s silence (*Griffin v. California*, 380 U.S. 609, 1965); prohibits the court from drawing an adverse inference from a defendant’s silence during police interrogation after a defendant had received a *Miranda* warning (*Miranda v. Arizona*, 384 U.S. 436, 1966); and requires the judge to actively

instruct the jury not to draw an adverse inference from a defendant's silence (*Carter v. Kentucky*, 450 U.S. 288, 1981).

Right to Silence and Court Errors

A right to silence attempts to prevent the jury from using the relevant information that is conveyed by a defendant's silence. Jeremy Bentham (1825, p. 161) famously argued that "Not only are the guilty served but it is they alone that are served [by the right to silence], without any mixture of the innocent." Bentham's reasoning was that only the guilty exercise the right to silence, and therefore the right can only benefit the guilty. Economic theory, however, has demonstrated that Bentham's argument is flawed.

Seidmann (2005) shows that the right to silence can indirectly benefit the innocent even if the right is exercised only by the guilty. Suppose the innocent always make exculpatory statements. The guilty must choose between making self-incriminating statements, remaining silent, or making false exculpatory statements, that is, lying. If the premium for confession is not too high, the guilty never make self-incriminating statements. Moreover, if the guilty remain silent, the jury rationally infers that they are guilty, since the innocent always make exculpatory statements. Therefore, if the right to silence is not available, the guilty always lie if the expected penalty for perjury is not too high. But then the innocent cannot signal their innocence to the jury through exculpatory statements since the guilty also make such statements. As a result, the jury cannot perfectly distinguish the innocent from the guilty, and some innocent defendants are inevitably convicted.

However, if the right to silence is available, the guilty always exercise it if the expected penalty for perjury is not too low and the right to silence is sufficiently effective at preventing the jury from drawing an adverse inference from silence. The innocent can then signal their innocence through exculpatory statements since the guilty do not make such statements and instead remain silent. The jury can then distinguish the innocent through their exculpatory statements, and innocent defendants are never convicted. In this way, the right to silence can indirectly benefit the innocent, even if only the guilty exercise it. By remaining silent, the guilty impose a positive externality on the innocent.

As Mialon (2005) argues, the right to silence can also benefit the innocent more directly. Evidence pertaining to culpability is rarely perfectly accurate. Even if the defendant is innocent, the evidence might indicate that he is guilty. In this case, the defendant would choose to remain silent if perjury is too risky. Moreover, the defendant might not know the evidence. In this case, he would have to remain silent. In either case, the innocent defendant might be wrongfully convicted if the adverse inference from silence is not blocked, but rightfully acquitted if it is blocked. Thus, the right to silence can reduce wrongful convictions and help the innocent even if perjury is not an option.

The guilty, of course, can also directly benefit from the right to silence. If a guilty defendant does not know the evidence, or knows the evidence and it correctly indicates that he is guilty, then he might be rightfully convicted without the right to silence, but wrongfully acquitted with it. By reducing convictions, the right to silence might reduce wrongful convictions, but only at the expense of increasing wrongful acquittals, and

therefore might involve an important tradeoff. If society prefers a wrongful acquittal sufficiently more than a wrongful conviction (as suggested by jurist William Blackstone's famous principle, "better that ten guilty persons escape than that one innocent suffer"), then a right to silence might directly improve social welfare. (For a discussion of Blackstone's principle, see Volokh, 1997.)

However, a right to silence can only directly increase welfare if the jury's preferences are biased relative to society's preferences. In choosing whether to convict the defendant, the jury makes a rational inference about the defendant's culpability given all the evidence in the case, which might include the defendant's silence. The jury then calculates its expected utilities from conviction and acquittal by weighing, on one hand, its utility from correct conviction and disutility from incorrect conviction, and on the other hand, its disutility from incorrect acquittal and utility from correct acquittal, by its rationally formed belief about the defendant's culpability. The jury chooses the verdict that yields the highest expected utility. If the jury's utility and disutility over correct and incorrect outcomes are the same as society's, and its inference about the defendant's culpability rationally takes into account all available evidence, then the jury's decision problem is the same as society's, and thus preventing the jury from making a rational inference from silence cannot generally improve social welfare.

The jury's preferences might be biased relative to society's in cases where juries unduly discriminate against defendants based on race or social class, or in cases where defendants cannot afford the attorneys who are best able to select the juries with the fewest biases against their clients (for a theoretical analysis of jury bias arising from jury selection, see Neilson and Winter, 2000). In such cases, the jury might attach too little (from a social standpoint) disutility to the outcome in which a defendant is wrongfully convicted. Such a jury might convict defendants if they had to remain silent when society might prefer that they be acquitted if they remained silent, in which case a right to silence could directly improve social welfare.

Mandatory Disclosure and Right to Silence

If some juries are unduly biased against a defendant, a right to silence can improve welfare, but whether it actually does so also depends on other factors, several of which are affected by the Fifth Amendment's right to due process of law. The right to due process of law includes a right of discovery, which requires the prosecution to share its evidence with the defense, especially if the evidence is exculpatory.

Mialon (2005) shows that mandatory disclosure of exculpatory evidence has an ambiguous effect on convictions without a right to silence. It tends to reduce convictions directly by increasing the chances that the defendant has exculpatory evidence to present, but also tends to increase convictions indirectly by making the jury's adverse inference from the defendant's silence more adverse. With mandatory disclosure, the jury knows that the defendant is better informed, and is less likely to believe that the defendant is silent because it does not know the evidence, and more likely to believe that it knows the evidence but is silent because the evidence is incriminating.

However, mandatory disclosure always reduces convictions with a right to

silence. With a right to silence, the jury is prevented from drawing an adverse inference from silence, and thus mandatory disclosure can only increase the chances that the defendant has exculpatory evidence to present, and therefore always reduces convictions. Moreover, with a right to silence, mandatory disclosure generally improves social welfare as measured in terms of court errors because it can only make the evidence less likely to be suppressed, which cannot harm and may benefit society so long as the evidence is sufficiently correlated with the truth. This in turn implies that the right to silence combined with mandatory disclosure (the Fifth Amendment) is more likely to improve social welfare than the right to silence alone.

Furthermore, the combination of the right to silence and mandatory disclosure is more likely to improve welfare if the police are more corrupt or biased. Innocent suspects are more likely to end up in court if the police are prone to racial and other prejudice and to disregarding the Fourth Amendment and other constitutional rights of suspects when they conduct their investigations. In such circumstances, more innocent defendants, and fewer guilty defendants, end up in court and stand to benefit from the rights to silence and due process. Donohue and Levitt (2001) provide evidence that the racial composition of police forces in different U.S. cities affects the racial patterns of arrests in these cities. They find that the higher the number of white police officers, the higher the number of nonwhites arrested, with no effect on the number of whites arrested. Theory suggests that the rights to silence and due process are more likely to improve social welfare in places where police discrimination of this kind is more widespread.

Fifth Amendment and Litigation Costs

The right to silence might also have another socially beneficial effect: it might increase the probability that cases settle, allowing society to save resources since trials are costly. We have argued that the right to silence might reduce the probability of conviction at trial. In the economic model of plea bargaining with prosecutorial discretion to dismiss cases, originally developed by Reinganum (1988), the sentence offer by the prosecution increases with the probability of conviction at trial, and the defense is more likely to reject sentence offers that are higher, so that the probability of trial is increasing in the probability of conviction at trial. The right to silence reduces the probability of conviction at trial as it shifts the burden of proof on the prosecution, and therefore increases the probability that cases settle before trial.⁴

Shavell (1989) develops a model of settlement bargaining in which plaintiffs have private information about the expected judgment at trial, and demonstrates that the right

⁴ Not only might a right against self-incrimination for defendants increase the probability of settlement, but the ability of defendants to waive their right against self-incrimination might facilitate cooperation bargaining, which occurs when the defendant has useful information to trade in return for leniency. As shown by Rasmusen (1998b), by waiving their right to exclude self-incriminating statements made during plea negotiations as evidence at their trial if bargaining fails, defendants can commit to provide the cooperation they promise in return for leniency (because if they do not, their earlier statements can be used against them at trial). In this way, defendants can obtain lower sentences in return for cooperation, and the government can benefit from the cooperation of defendants.

of discovery at the settlement stage can also reduce the probability of trial. In the model, if all plaintiffs can establish their information, then in equilibrium if their information is not sufficiently favorable, they remain silent and settle with defendants at an amount that reflects the adverse inference about the expected judgment at trial that defendants draw from their silence; and if their information is sufficiently favorable, they reveal it to defendants to settle at an amount that is higher than the amount at which they would settle if they remained silent.

Silent plaintiffs would only go to trial if they expected to do better at trial than the settlement they would receive if they remain silent. But if their expected judgment at trial is higher than the settlement they receive given silence, and they can establish their expected judgment, then they would reveal it to defendants and settle for a higher amount. In the model, trials only occur if some plaintiffs cannot establish their expected judgment, and therefore must remain silent. In this case, some of the silent plaintiffs have high expected judgments but cannot establish this information, and thus do not settle with defendants, and instead go to trial.

The right of discovery forces plaintiffs who can establish their information to reveal it to defendants before trial. Therefore, with the right of discovery, only plaintiffs who cannot establish their information might remain silent. Silent plaintiffs then receive a higher settlement offer from defendants because the adverse inference that defendants draw from their silence is less adverse, since defendants cannot infer from their silence that their expected judgments are necessarily low, and must infer instead that they are silent because they cannot establish their information. Given a higher settlement offer, more silent plaintiffs settle. Therefore, the right of discovery at the pre-trial stage, like the right to silence, increases the probability of settlement.

According to economic theory, the Fifth Amendment's rights to silence and due process of law not only improve social welfare as measured in terms of court accuracy if jury and police discrimination are sufficiently widespread, but they may also reduce litigation costs.

Evidence on the Right to Silence and Crime Clearance

While the right to silence might have several social benefits, it also might reduce the police's ability to solve cases. The effect of the right to silence on crime clearance rates has been empirically tested with time series data. Examining data on the FBI's crime clearance rates before and after the Supreme Court's 1966 decision in *Miranda v. Arizona*, Cassell and Fowles (1998) conclude that *Miranda* reduced aggregate clearance rates for violent and property crimes by about 7 percent.

However, after analyzing the study by Cassell and Fowles, Donohue (1998) expresses serious reservations about the data, regression model, and results. The FBI's data on reported crime, which Cassell and Fowles examine, have been affected by political manipulation, changes in the methods of reporting crime to improve accuracy, and changes in the pool of reporting cities, over time. Moreover, Donohue finds serious flaws in the regression model that Cassell and Fowles employ to estimate the effect of *Miranda* on the FBI's crime clearance rates. The authors do not control for other factors

that affect crime clearance rates, including rising crime rates, declining police resources, rising drug use, and the implementation of the exclusionary rule in *Mapp*. Thus, the authors are falsely attributing all of these effects to *Miranda*.

Given the problems with the data and model, limiting the regression analysis to murder might yield the most accurate results, since murder is the most accurately-reported crime, but Cassell and Fowles find no statistically significant effect of *Miranda* on homicide clearance.

6. THE RIGHT TO JURY TRIAL

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the state and district wherein the crime shall have been committed...

Sixth Amendment to the U.S. Constitution

In the fourth stage of crime and punishment, after the defendant and prosecutor have chosen what evidence to present, the judge or jury evaluates the evidence and chooses whether to convict the defendant. A jury might evaluate the evidence differently, and therefore might arrive at a different verdict than a judge. For this reason, the defendant's right to choose whether to be tried by a judge or a jury in the first place is an important issue. The Sixth Amendment protects the right to trial by jury in criminal cases. The right of defendants to have their criminal culpability determined by a jury of their peers is a safeguard against overzealous prosecutors and biased judges. Imposing an all-judge system in criminal cases might just be inconsistent with the objective of trial fairness. But then why not impose an all-jury system? The Sixth Amendment right to trial by jury in criminal cases is the right to choose between a jury and a bench trial. That is, criminal defendants still have the option of a bench trial. Economic theory can provide an efficiency justification for the criminal defendant's right to unilaterally waive a jury trial.

Right to Choose Jury or Bench Trial

Gay *et al.* (1989) analyze a model in which criminal defendants have the right to a jury trial, which they are free to waive. The defendants, who are either guilty or innocent, choose between a jury and a bench trial to minimize the probability that they are convicted. The trial then generates evidence that is perceived by the fact-finders as either favorable or unfavorable to the defendant. The fact-finders are more likely to perceive the evidence as favorable to the defendant if the defendant is innocent than if the defendant is guilty. The main assumption is that juries do not process the evidence as efficiently as judges; that is, juries are "noisier" than judges. More precisely, juries are more likely than judges to perceive the evidence as favorable when the defendant is guilty, and as unfavorable when the defendant is innocent.

If juries and judges base their verdicts solely on their perception of the evidence, and not on their prior beliefs and the defendant's choice of trial mode, as the rules of evidence usually mandate, then in equilibrium, all defendants choose a bench trial if they

are innocent, and a jury trial if they are guilty. Guilty defendants rationally choose the trial mode that makes the most errors, and therefore choose a jury trial. Innocent defendants rationally choose the trial mode that makes the least errors, and therefore choose a bench trial. The equilibrium conviction rate is lower in bench trials than in jury trials because evidence is more likely to be favorable if defendants are innocent than if they are guilty, and because judges are more likely than juries to perceive the evidence as favoring defendants when defendants are actually innocent.

This simple theory generates two testable predictions. First, assuming that more defendants are guilty than innocent, which is a reasonable assumption if the Fourth Amendment, Fifth Amendment, and other rights of suspects are generally respected, then more defendants should choose a jury trial than a bench trial since guilty defendants all choose the former and innocent ones all choose the latter. Second, the conviction rate should be lower in bench trials than in jury trials since innocent defendants are more likely to be acquitted than guilty ones.

Evidence on Jury and Bench Trials

Examining data from 1981 to 1986 on jury and bench trials in Florida and Texas for different crime categories, Gay *et al.* find that the proportion of defendants choosing a jury trial is higher than the proportion choosing a bench trial, and the difference is statistically significant, in every year from 1981 to 1986 in both Florida and Texas, and for every crime category, except for drug-related crimes in Texas in 1984. Moreover, the authors find that the conviction rate is higher in jury trials than in bench trials in all years, in both states, and in all crime categories, and the difference is statistically significant in every case except for capital crimes in Florida in 1985 and in Texas in 1984.

The evidence indicates that most defendants choose jury trials even though the conviction rate is higher in jury than in bench trials. This in turn supports the validity of the assumption that juries are “noisier” than judges. If judges were noisier than juries, then innocent defendants would choose jury trials, and guilty defendants would choose bench trials. Under those circumstances, the conviction rate for bench trials would be higher, which is not the case. Therefore, unless defendants do not make their choice of trial mode rationally, judges cannot be noisier than juries.

Efficiency of Right to Jury Trial

In the model described above, given the assumption that juries are noisier than judges, the right to a jury trial increases the accuracy of trial outcomes relative to a system in which jury trials are mandated. The right to waive a jury trial benefits the innocent because waiving the right allows them access to a more accurate fact-finder. Therefore, innocent defendants are always better off in a system with the right to waive a jury trial than in all-jury system. Moreover, conviction rates for the guilty would be the same under both systems, since the guilty choose jury trials even when they have the

right to waive a jury trial. Therefore, the right to waive a jury trial in criminal cases enhances the objective of trial accuracy.⁵

7. THE RIGHT AGAINST EXCESSIVE PUNISHMENT

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Eighth Amendment to the U.S. Constitution

In the fifth stage of crime and punishment, if the judge or jury has decided to convict the defendant, the nature and severity of the punishment is determined. The Eighth Amendment protects the right against cruel and unusual punishment. The Supreme Court has held that punishment is cruel and unusual if it is excessive (*Weems v. United States*, 217 U.S. 349, 1910), that the death penalty is excessive punishment for rape, and by implication, any crime other than murder (*Coker v. Georgia*, 433 U.S. 584, 1977), and that a prison sentence that is disproportionate in length relative to the severity of the offense is also cruel and unusual (*Solem v. Helm*, 463 U.S. 277, 1983).

An increase in the severity of punishment can deter more potential criminals from committing crime, and incapacitate more “hardened” criminals, thereby reducing crime even further. But it can also result in innocent people being punished more harshly to the extent that the justice system is inaccurate. There is a potential tradeoff between deterrence and incapacitation, on one hand, and wrongful punishment, on the other.

Deterrence and Maximal Punishment

Miceli (2004, Chapter 9) and Eide, Rubin, and Shepherd (2006) provide summaries of the economics of crime and deterrence and criminal behavior in general. In the basic economic model of crime, originally developed by Becker (1968), individuals choose to commit a given crime if and only if their individual benefit from the crime exceeds the expected cost of it, which is the probability of being caught and convicted multiplied by the punishment upon conviction. If either the probability of being caught and convicted or the severity of the punishment is increased, then more individuals are deterred from committing crime.

Apprehending and convicting offenders requires large public expenditures on police and courts. In contrast, the costs of imposing certain punishments, such as fines and execution, are much lower. Even the costs of imprisonment might be lower, because these costs are only incurred if offenders are convicted. The economic model therefore implies that, for any given deterrence level, the probability of conviction can be decreased, and the punishment increased, to achieve the same deterrence level at lower cost. Moreover, the model suggests that additional deterrence can generally be achieved most efficiently by increasing the severity of punishments, although this strategy might

⁵ The Seventh Amendment protects the right to trial by jury in civil cases, which is different than in criminal cases. In civil cases, both the plaintiff and defendant must agree to waive a jury trial. In Appendix II, we examine the economics of the Seventh Amendment.

be inconsistent with *Solem*.

Punishments differ in their costs of imposition. Fines are less costly to impose than imprisonment. As shown by Polinsky and Shavell (1984, 2000), the optimal policy therefore involves using fines up to the maximum of an offender's wealth before using imprisonment. Capital punishment might also be less costly to impose (in terms of resources) than imprisonment, and might therefore be an efficient means of deterring crime (although Baiker, 2004, finds that capital trials are quite expensive for local jurisdictions). Indeed, the basic economic model suggests that capital punishment might be optimal even for minor crimes. If punishment is sufficiently severe, crime is completely deterred, so punishment does not actually take place. With deterrence as the objective, the optimal policy is to set maximal penalties for all crimes and a minimal probability of conviction.

However, in practice, offenders are rarely fined up to the maximum of their wealth, and capital punishment is never imposed for minor crimes. Why?

The Punishment Should Fit the Crime

Stigler (1970) argues that scaling punishment according to the severity of the offense might be more efficient because it is the only way to preserve marginal deterrence. With a single severe punishment for all offenses, criminals who have committed a few minor offenses would have no direct disincentive to commit additional and more severe offenses before they might be caught. Therefore, punishments should not be maximal except for the most severe crimes. Of course, if punishment is sufficiently severe, crime is completely deterred and there is no need for marginal deterrence. But even the death penalty might not deter all crime, and criminals facing the death penalty would then have no disincentive to commit additional crimes (e.g., killing a prison guard while on death row).

Scaling punishment according to the severity of the offense might be optimal for other reasons as well. While some law enforcement can be specific to an offense (e.g., efforts to entrap and prosecute sexual offenders), much law enforcement is general (e.g., police patrol). General law enforcement affects the probability of apprehension for those who commit less severe offenses as well as for those who commit more severe offenses. For example, a greater number of police officers might be put on patrol to catch rapists and murderers with the side effect that more shoplifters are caught, since the police are still present to apprehend shoplifters. Shavell (1991) demonstrates that a uniformly maximal punishment for offenses differing in severity might be socially optimal when law enforcement is specific, but that it is optimal to scale the punishment according to the severity of the offense when some law enforcement is general.

When law enforcement is specific to the offense, if the social harm produced by the offense is lower than the social cost of apprehending the offender, it is socially optimal to set the probability of apprehension at zero. The optimal apprehension probability is positive if the harmfulness of the offense is higher than the cost of apprehension. For all offenses that satisfy this condition, it is optimal to set the maximal punishment, since deterrence can be achieved at lower cost by increasing the punishment

and lowering the apprehension probability.

However, when law enforcement is general, the apprehension probability does not depend on the harmfulness of the offense. In this case, the optimal apprehension probability is always positive, since a certain probability of apprehension is required to deter the more harmful offenses. The punishment, on the other hand, can depend on the harmfulness of the offense. It is socially optimal to set the expected punishment for an offense equal to its harmfulness, since this causes those who might commit the offense to internalize its social costs. But the expected punishment is equal to the apprehension probability multiplied by the punishment. Therefore, the optimal punishment must increase with the harmfulness of the act.

When law enforcement is general, a uniformly maximal punishment is not socially optimal. The positive probability of apprehension, which is required to deter the more harmful acts, is sufficient to efficiently deter the less harmful acts, so that society does not need to threaten those who might commit less harmful acts with the maximal punishment that it employs to deter those who might commit the most harmful acts.

Andreoni (1991) argues that there is yet another reason why it might be optimal to scale the punishment to the severity of the offense. The probability of conviction and the scale of punishment are not generally independent of each other, as is assumed in the basic economic model. In particular, if the punishment following conviction is increased, the probability of conviction might fall because jurors might become more reluctant to convict. When choosing whether or not to convict, jurors take into account the possibility that they might convict an innocent person, or acquit a guilty person. If the cost of acquitting a guilty person rises, they are more likely to convict. If the cost of convicting an innocent person rises, they are less likely to convict. An increase in the punishment increases the cost of convicting an innocent person, without affecting the cost of acquitting a guilty person, and therefore, tends to reduce the probability of conviction.

An increase in the punishment might directly reduce crime, but it might also indirectly increase crime by reducing the conviction probability. It is even possible that the indirect effect would dominate the direct effect, so that an increase in punishment would actually increase crime overall. An increase in the punishment makes conviction more risky for jurors. Accordingly, if jurors are very risk averse, they respond to an increase in the severity of punishment by significantly reducing the probability of conviction. An increase in the severity of the punishment also makes committing crime more risky for criminals. But if criminals are not very risk averse, they respond to an increase in the severity of the punishment by committing only slightly less crime. Hence, if jurors are very risk averse and criminals are not, an increase in the punishment can actually increase crime.

This in turn implies that, with maximal deterrence as the objective, the optimal policy is to have the punishment fit the crime, as prescribed by the Eighth Amendment. As the punishment increases, the cost of wrongful conviction increases, while the cost of wrongful acquittal remains the same, so the probability of conviction falls. There is a maximal punishment beyond which jurors are not willing to convict. Moreover, the cost of acquitting a guilty person is higher if the severity of the offense is higher. Therefore, if the offense is more severe, jurors are more willing to convict, so the maximal punishment

at which jurors are still willing to convict is higher. Hence, the punishment scheme that ensures maximal deterrence is one in which the severity of the punishment grows with the severity of the offense.

Incapacitation

Aside from deterrence, another purpose of certain punishments, including imprisonment and the death penalty, is incapacitation. Shavell (1987) develops the economic model of incapacitation. In the model, individuals impose a per-period harm, and imprisonment imposes a per-period cost, on society. Ignoring any deterrence or rehabilitation effects from imprisonment, the optimal policy with respect to incapacitation is to imprison an individual whenever his per-period harm exceeds the per-period cost of imprisonment. If the individual's per-period harm remains constant throughout his lifetime, then if it is ever optimal to imprison him, it is optimal to imprison him for life. However, if his per-period harm declines with age, it is optimal to release him as soon as his per-period harm falls below the per-period imprisonment cost.

The death penalty is an alternative to life imprisonment. The resource cost of imposing it is small compared to that of imposing a life sentence. However, as Shavell points out, the actual cost of the death penalty might also include the negative effects that it might have on the public's perception of the value of life. A necessary condition for the death penalty to be optimal with respect to incapacitation is that its actual cost be smaller than the cost of imprisoning the individual for the rest of his life when imprisoning him for life is optimal. If this condition is satisfied, the death penalty is optimal if its cost is lower than the harm that the individual would cause over the remainder of his life when imprisoning him is not optimal. If the individual has a longer life ahead of him, the cost of imprisoning him for life, and the harm that he would cause if he were not imprisoned, are both higher, so the death penalty is more likely to be optimal.

Wrongful Punishment and Voting

However, the cost of imposing the death penalty on an innocent person is higher if the person has a longer life ahead of him. Deterrence and incapacitation are not society's only concerns when setting the severity of punishment. The possibility of wrongful punishment is also a concern. Palmer and Henderson (1998) argue that citizens vote against capital punishment as insurance against the possibility that they might be wrongfully punished themselves.

Persson and Siven (2007) develop an economic model that accounts for the possibility of wrongful conviction and endogenizes the process of voting on the severity of punishment. If the median voter runs the risk of being wrongfully convicted, he might vote against more severe punishments, and they would not be instituted. However, if a punishment is sufficiently severe, all crime is deterred, so the median voter never runs the risk of being wrongfully convicted. A vote by the median voter against a severe punishment requires the presence of a mass of "hard" criminals who would not be deterred by the severe punishment. Only then would the median voter run the risk of

being wrongfully convicted. Paradoxically, therefore, capital punishment is less likely to be implemented in the presence of a greater mass of hardened criminals.

Evidence on Incapacitation and Deterrence

Severe punishment might have positive deterrence and incapacitation effects, but might also have negative effects given the possibility of wrongful conviction. Whether severe punishment is efficient overall depends on the relative importance of these effects. It is difficult to estimate the frequency of wrongful convictions, because in many cases culpability can never be ascertained completely. However, it is possible to distinguish and measure the deterrent and incapacitation effects of punishments. Kessler and Levitt (1999) argue that sentence enhancements provide no additional incapacitation in the short run (because the criminal would have gone to jail anyway) but do provide additional deterrence. Using California's law on sentence enhancements, they find that there are both deterrence and incapacitation effects from criminal punishment.

Evidence on Deterrent Effects of Capital Punishment

Ehrlich (1975, 1977) conducted the first empirical work by an economist to examine the deterrent effects of capital punishment. This work was highly controversial and led to extensive additional analysis—most it a reanalysis of the Ehrlich data. Results were mixed; several analysts found a deterrent effect while several did not. Recently, there has been a “second wave” of studies reexamining the possibility of a deterrent effect. This new set of studies uses more advanced statistical techniques than those used by Ehrlich, on more complete data.

Katz, Levitt, and Shustorovich (2003) examine the effect prison death rates and execution rates on crime rates using state-level panel data from 1950 to 1990. They find that higher death rates significantly reduce violent crime and property crime rates. In some estimations, they find that both the death rate and the execution rate reduce the murder rate. However, in most of their specifications they find no deterrent effect of the execution rate. Mocan and Gittings (2003) examine the effect of executions and reductions in sentences of death-row prisoners on murders using state-level panel data from 1977 to 1997. They find a deterrent effect. In particular, each execution deters an average of 5 murders, and each reduction in sentence results in an average of one additional murder. Dezhbakhsh, Rubin and Shepherd (2003) examine the effects of death row sentences and executions on murder rates using county-level data from over 3000 counties from 1977 to 1996. This is the only study to use county-level data. The authors find that capital punishment has a strong deterrent effect. In particular, they find that each execution deters an average of 18 murders.

Zimmerman (2004) examines the effect of executions on murder rates using state-level panel data from 1978 to 1997, and Zimmerman (2006) examines the effects of different execution methods on murders using state-level panel data from 1978 to 2000. In both papers, the author finds a significant deterrent effect of capital punishment. He estimates that each execution deters an average of 14 murders and that executions by

electrocution have the strongest impact. Also examining the effect of executions on murders using state-level panel data, Shepherd (2005) finds that states that have executed more than approximately 9 murderers have had reductions in the number of murders (a deterrent effect), while states that have executed fewer murderers have experienced increases in the number of murders (what may be called a “brutalization” effect). Thus, the author finds a “threshold effect” of capital punishment.

Donohue and Wolfers (2005) replicate several of the studies that find a deterrent effect from capital punishment, including Dezhbakhsh, Rubin and Shepherd (2003). They find that the results of these studies are “sensitive” to the econometric specification. In particular, when a key state, like Texas, is excluded from the sample, or the instrumental variables that are used to disentangle cause and effect are measured in a different way, the estimated deterrent effects of capital punishment are smaller and sometimes no longer statistically significant.

While the death penalty might deter homicides, states with higher homicide rates might also be more likely to enforce the death penalty. To solve this causality problem, one needs variables that affect the probability of receiving a death sentence conditional on a murder charge but do not affect the homicide rate. One of the instrumental variables employed by Dezhbakhsh, Rubin and Shepherd (2003) is the Republican presidential candidate’s share of the state-wide vote in the most recent election, since Republican majorities might be more likely to enforce the death penalty. However, Donohue and Wolfers find that the Republican presidential vote share affects homicide rates directly through channels other than execution, and thus might not be a valid instrument. In an unpublished paper, Dezhbakhsh and Rubin (2007) address this and other issues raised by Donohue and Wolfers. They find a number of flaws in Donohue and Wolfers’s sensitivity analysis (including selectivity in reporting results), and find that most of the specifications indicate a deterrent effect. The question at this time remains open.

8. CONCLUSION

In this paper, we showed how economics can be fruitfully applied to analyze the individual rights and freedoms guaranteed by the Bill of Rights. In particular, we showed how economic theory and econometric analysis can be used to evaluate the effects and social efficiency of policies related to the amendments comprising the Bill of Rights. Much important work remains to be done.

For example, one area that could use further research is the relationship between freedom of the press and the behavior of police and prosecutors. These officials have a good deal of discretion in their day-to-day functioning, and abuse is possible for various reasons. For example, prosecutors may target particular individuals for political gain. This behavior cannot be controlled unless it is known, and freedom of the press is an important method of providing information about such behavior to individuals (who are also voters).

As another example, in analyzing policies related to the Second Amendment’s right to bear arms, economists have focused on estimating the effect of shall-issue laws on crime, and the results have been contradictory. According to economic theory, the

effect of guns on crime is ambiguous, given that guns have both a deterrent and a facilitating effect. However, theoretically, sentence enhancements for crimes committed with a gun should unambiguously reduce crime, since they reduce the facilitating effect without affecting the deterrent effect. Moreover, guns should unambiguously increase gang violence, since they increase the unpredictability of fight outcomes. Estimating the effect on crime of gun crime sentence enhancements, and the effect of guns on gang violence, might yield clearer results.

In analyzing the Fourth Amendment's right against unreasonable searches and seizures, economists have focused on the exclusionary rule for police searches without probable cause. It would also be interesting to analyze the effects and efficiency of the warrant or probable cause standard. One could characterize the meaning of "reasonable" search by deriving the warrant standard that minimizes the social costs of crime and privacy invasion, and then analyze how the efficient standard varies with the nature of the crime and with progress in search technology.

And in analyzing the Fifth Amendment's right against self-incrimination, economists have focused on the effects of preventing the jury from drawing any adverse inference from silence during police interrogation. But a more direct way to induce confession is through torture. It would be interesting to analyze the effects and efficiency of the more fundamental right not to be tortured into self-incrimination, especially given recent debates about the use of torture to extract information in terrorism investigations.

This paper's discussion of existing theory also illuminated various links between the Amendments. For example, the Fourth Amendment interacts with the Fifth Amendment: with stronger Fourth Amendment rights, innocent suspects are less likely to end up in court, so a right to silence is less likely to improve social welfare as measured in terms of court errors. And the First Amendment relates to the Fourth Amendment: the freedoms of speech and of the press increase police accountability, which in turn increases the effectiveness of the exclusionary rule in reducing police searches that lack probable cause.

Indeed, the First Amendment relates to all of the other amendments comprising the Bill of Rights. The freedoms of speech and of the press are essential to political competition and democracy, which in turn determine virtually all policies, including those related to gun control, privacy invasion, and capital punishment. Connections between the First Amendment and the behavior of various agents in the system is an area little studied by economists, and one where further economic research might yield a very high payoff.

There is more work to be done on analyzing the interactions between each of the amendments and on endogenizing the laws related to those amendments by modeling the underlying political process. One could, for instance, analyze voting on gun control, as Persson and Siven (2007) have modeled voting on the death penalty. A more ambitious task would be to combine insights from economics, politics, and constitutional law to formulate a multi-stage model of politics, crime, and punishment. Citizens would first vote, behind the veil of ignorance, on the extent of the rights to be conferred by each of the amendments. They would then choose whether to commit crime, and how to defend against crime, given the extent of their right to bear arms; police would then choose

whether to search and arrest citizens given the extent of the right against unreasonable searches; and judges or juries would then choose whether to convict citizens who have been arrested, and determine the punishment of convicted offenders, given the extent of the right against cruel and unusual punishment. Within such a model, one could analyze all the interactions between the rights protected by the amendments, and thereby arrive at a more comprehensive understanding of the Bill of Rights.

Finally, we have mainly confined our analysis to the effects of the Bill of Rights on crime. But many of the rights have important civil implications as well. We have largely ignored discussions of matters such as commercial speech and the takings clause. Moreover, many of the rights we have analyzed have implications for non-criminal matters—juries are required for civil as well as criminal disputes; guns may be valuable to preserve freedom from excessive government control and tyranny. In the Appendices, we discuss two of these issues, but another paper could be written on these issues as well.

Appendix I: Freedom of Commercial Speech

Although the First Amendment refers to “speech” without any qualifier, courts have long distinguished between commercial and political speech, and have provided less protection to commercial speech, including advertising. However, free competition in advertising may be beneficial to consumers. In an influential article, Benham (1972) shows that in states that allowed advertising of eyeglasses, prices were significantly (about 20 percent) lower than in states that forbade such advertising. In 1976, in a case involving the advertising of eyeglasses in Virginia (426 U.S. 748), the Supreme Court cited Benham’s paper and for the first time gave some protection under the First Amendment to commercial speech that was truthful and not misleading. Their reasoning was explicitly economic: advertising would lead to lower prices for consumers. In a 1977 case involving attorney advertising in Arizona (433 U.S. 350), the Court reaffirmed and strengthened its economic arguments. Bans on advertising by producers of eyeglasses and other professionals such as attorneys are now commonly viewed as forms of rent seeking by members of the profession who are happy to avoid price competition (McChesney, 1997).

The current standard for advertising regulation is the four part “Central Hudson Test.” First, commercial speech is not protected by the First Amendment if it concerns unlawful activity or is misleading. Second, if the commercial speech concerns lawful activity and is not misleading, the court will determine “whether the asserted governmental interest is substantial.” Third, if the interest is substantial, the court “must determine whether the regulation directly advances the governmental interest asserted.” Fourth, the court must determine “whether [the regulation] is not more extensive than is necessary to serve that interest,” an economic criterion. To survive a First Amendment challenge, a regulatory agency of the government has the burden of proving that its restriction on commercial speech satisfies the Central Hudson Test. Regulation by the Federal Trade Commission (FTC) has generally been accepted by the courts as meeting this test.

In two papers, Coase (1974, 1977) points out the inconsistencies between the treatment of political and commercial speech, indicating that people have a greater ability to learn about commercial products than about politicians, and that most consumers would probably value commercial information more highly than political information. Jordan and Rubin (1979) point out that there were common law remedies for any deception in commercial speech, and argue that the FTC did not provide much if anything in the way of added benefits through its regulation of commercial speech. Rubin (1991) further argues that regulation of deception could lead to excessive government control over commercial speech.

Firms can be deceptive in their advertisements about the prices of their goods. “Deceptive pricing” is the advertising of prices that are not actually common transaction prices. (For a good analysis of these issues, see Calfee, 1997, Chapter 7.) Ads such as “Regularly \$50, now \$25” or “\$50 elsewhere, here \$25” might be considered deceptive unless “enough” sales had occurred at the \$50 price, where enough can be defined in various ways. The FTC seldom if ever brings deceptive pricing cases, and has not for many years. This is

because the FTC generally recognizes that any advertising that stresses prices is likely to ultimately lead to lower prices for consumers.

Firms can also be deceptive in their advertising of the nature of their products. The nature of language is such that almost any claim about that nature of a product could be interpreted as being deceptive or misleading under some readings, so that there are many cases that could be brought (Craswell, 1985). In addition, most cases brought by the government are settled through consent decrees (a procedure under which the firm does not admit to wrongdoing, but promises to cease the challenged conduct), so that there is little litigation over the issue of deception. This may be because of the high reputation cost to a firm from being named as engaging in deception (Peltzman, 1981). Mathios and Plummer (1989) find that firms that contest FTC orders end up with greater capital losses than firms that consent without a contest. Since few cases are contested, it is important for regulatory officials to have a strong theoretical basis for bringing some cases and not others. Economics provides this theoretical basis.

Economic analysis suggests that there are three types of characteristics of goods with respect to advertising. These are called “search,” “experience” and “credence” characteristics. (For a discussion of search and experience goods, see Nelson, 1970 and 1974; for credence goods, see Darby and Karni, 1973.) Search characteristics can be determined before the associated goods are purchased; an example is the color of a suit. Goods must be purchased and used before experience characteristics can be evaluated; an example is the cleansing power of a soap. For credence characteristics, the consumer may never know if the characteristic exists, even after purchase; an example is unnecessary repair to a TV (or unnecessary surgery), for the TV (or the body) will work afterwards even if the repair was unneeded.

Given this classification, some principles of regulation of advertising are instantly obvious. First, for search characteristics, there is no need for regulation. Consumers can determine if the good has the advertised characteristic, and cannot be deceived. Moreover, since this is so and firms understand that it is so, there is no incentive for deceptive advertising with respect to these characteristics. Transaction price is a search characteristic (i.e., consumers will know the transaction price before purchase), which is why regulation of advertising of transactions prices, discussed above, is unneeded and counterproductive. Second, for inexpensive goods, there is little cost to deception about experience characteristics. The consumer will be deceived at most one time about such goods, and so in general losses will be small. Regulators should concentrate on relatively expensive experience goods and particularly on credence goods.

This analysis has additional implications. In particular, it points to the importance of reputation as a protection against deception and to the importance of advertising in generating a reputation. Apparently noninformative advertising might seem to be a puzzle. Nelson (1970, 1974) shows that in certain circumstances the very existence of advertising itself provides information. Advertising would be worthwhile only if it led to repeat sales for experience goods, but firms could expect repeat sales only if the product were of sufficiently high quality. Therefore, the willingness of a firm to spend money on advertising would itself provide information to the market that the firm expected repeat sales because it believed that its products were of high quality.

Problems of assuring quality arise in many markets. The classic analysis by Akerlof (1970) shows that a product market can fail given such problems. Producers of the product are likely to be better informed about the quality of their product than consumers. If consumers could not distinguish product quality there could exist a lemons market, and consumers would only be willing to pay a price that is proportional to the average quality of the product in the market. But the producers of the highest quality products would not be willing to sell their products at this price and would thus exit the market, which would lower consumer expectations about the quality of the remaining products, leading the sellers with the next highest quality products to exit, and so on until only the lowest quality products may be supplied. Adverse selection can lead to complete market failure. The problem exists only if firms cannot convincingly communicate to consumers the quality of their products. If firms can produce high quality products and convince consumers that they are doing so, the market failure disappears. Through advertising, firms can signal quality to consumers, thereby mitigating the adverse selection problem.

Klein and Leffler (1981) explicitly relate Nelson’s discussion of advertising to Akerlof’s adverse selection problem. They show that the mechanism identified by Nelson and related mechanisms could be used to mitigate adverse selection. Investments in nonsalvageable firm-specific capital (capital which would become worthless if the firm were to shut down) would serve to guarantee quality since the firm would lose the value of

these investments if consumers dissatisfied with low quality products forced it to shut down by withdrawing patronage. Advertising, including endorsements by celebrities, is a prime example of these kinds of capital investments. Generalizations to the analysis are provided by Shapiro (1983). Lynch, Miller, Plott, and Porter (1986) provide an experimental test of these models. They find that truthful advertising eliminates the adverse selection problem in laboratory market settings and that reputations sometimes serve to eliminate the problem as well.

So far, we have dealt with deception in the form of false statements. However, an additional class of acts that are sometimes viewed as deceptive are statements that are true but incomplete in some way that is viewed as material. For these cases, regulatory agencies impose various remedies. Sometimes sellers are held to commit “deception by omission.” In other cases, there is some mandated disclosure associated with an advertisement.

An example of a statement which is alleged to be deceptive by omission is from a filing before the FTC, “in re: The Almond Board of California ‘Petition to Prohibit False and Misleading Advertising,’” submitted by the Center for Science in the Public Interest on January 29, 2001. The allegation was that “while the almond ad states that increased almond consumption will lower your blood cholesterol levels, and thereby lower your risk of CHD, it fails to disclose that almonds are high in calories.” An example of mandated disclosure is the set of warnings on cigarette packs and in cigarette advertising. These disclosures are across-the-board since any ad for a cigarette requires a health warning.

While such disclosure remedies are common, economic analysis casts doubt on their general utility. There is much support in the literature for the proposition that, as long as deception is not allowed, there are incentives for sellers to disclose even the negative attributes of their products. This is because consumers will rationally assume that any advertisement that omits a critical piece of information (say, the durability of a product) will imply that the value of that attribute for that product is at the lowest level. Thus, producers of products with quality levels above the minimum will have incentives to advertise this fact, and in the limit the market will provide complete information. The models that prove this result are quite general, and the result seems robust. The result is derived in Grossman (1981), Milgrom (1981), and many other sources. For a summary discussion, see Spulber (1989, pp. 449-455).

At first, this proposition may seem unrealistic. However, consider price. The price of a product is a negative characteristic; we would all prefer to get products free. Nonetheless, sellers do routinely advertise prices. As the theory would predict, the advertising is driven by those firms with the lowest prices (that is, the least bad value for a negative attribute.) Higher priced sellers may not advertise price at all, but when a consumer observes a product being advertised with no price information, the normal assumption is that it is not a discount price, and may be a high price.

Another example is the advertising of tar and nicotine content of cigarettes (Calfee, 1997). In the 1950s (and perhaps earlier), consumers began to fear the health effects of smoking, and began to believe that tar and nicotine were undesirable. As a consequence, cigarette companies began to advertise the levels of tar and nicotine, with the advertising being stimulated by those brands with the lowest levels of tar and nicotine. (This practice was greatly curtailed in 1959 when the FTC virtually banned such advertising.) Nonetheless, there was a substantial incentive for advertisers to publicize the negative aspects of their products, as long as some brands had less negative characteristics than others.

The process of advertising negative characteristics is the obverse of the lemons problem, discussed above. In a lemons market, information is not verifiable, so only low quality products are sold because sellers cannot convince buyers to pay for high quality products. The process by which negative characteristics are advertised requires some form of verification, but the theory indicates that if there is some method of checking on claims, then sellers will offer complete information about both high and low quality products. The analysis shows that if the lemons problem can be solved, sellers of high quality products will have incentives to reveal that their products are indeed of high quality. But this means in the limit that any seller of a product that is of any quality above the minimum will indicate quality. Consumers may then assume that any product that does not disclose quality is of minimum quality, and the informational problem is solved.

Appendix II: The Right to Jury Trial in Civil Cases

In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved...

Seventh Amendment to the U.S. Constitution

Whereas in criminal cases, defendants can unilaterally waive their right to a jury trial, in civil cases, both the plaintiff and defendant must agree in order to waive a jury trial. Moreover, bias on the part of judges might be less of a problem, and bias on the part of juries might be more of a problem, in civil cases. Juries, which are usually comprised of lay persons, might be systematically biased against large corporate defendants, for example. A jury system could therefore be inferior in civil cases.

However, even if juries are biased, they might nonetheless reach the efficient or full information decision. Froeb and Kobayashi (1996) develop a model of trials in which evidence production by the litigants is endogenous. They show that, in equilibrium, the litigants' choices of effort in producing evidence can eliminate an exogenous jury bias, that is, a jury's prior belief that one of the litigants is correct. If the jury's prior belief favors the plaintiff, then the plaintiff free rides on the jury's bias against the defendant, and thus puts in less effort in producing evidence, whereas the defendant compensates for the jury's bias by putting in more effort in producing evidence. Overall the evidence produced is then more likely to be in favor of the plaintiff, thereby mitigating the effects of the jury's initial bias against the plaintiff. This suggests that jury bias in civil cases might be less of a problem than conventional wisdom suggests.

There is empirical and experimental evidence on the differences between juries and judges. Juries systematically grant larger awards in personal injury cases. The average award granted by judges amounts to only 31 percent of the average jury award. Examining data from 1988 to 1996 on settlement and trial outcomes, Helland and Tabarrok (2000) attribute most of this difference to the types of cases that go before judges and juries. High-award cases, such as those in product liability and medical malpractice, make up a larger proportion of the cases seen by juries than for judges, who see a larger proportion of low-award cases, which include premises liability and auto injury cases. Controlling for severity of injuries, variations in tort law, number of defendants, and local poverty rates, nearly two-thirds of the difference in awards can be explained by the different composition of cases seen by judges and juries.

Significant differences in the decision-making process across judges and juries can also help to explain the variation in award amounts. Plaintiffs predominantly choose jury trials, even in case categories where judge win rates are higher than jury win rates. Juries tend to be more sympathetic towards injured victims and grant larger awards than judges and are more likely to rule in favor of plaintiffs in product liability and medical malpractice cases. Plaintiffs are more likely to win cases before juries than judges for all categories except auto injury. The higher win rate of judges is attributed to the higher proportion of auto injury cases before judges than juries.

Sunstein, Hastie, Payne, Schkade, and Viscusi (2002) present an experimental examination of the decision-making process of jurors, juries, and judges and the large variability of punitive damage awards. They attribute much of the unpredictability of juries' decisions to systematic biases. While juries are able to accurately assess the relative moral offensiveness of a defendant's action, they are unable to reliably discern liability or assess dollar awards. In assessing a defendant's liability, jurors are prone to hindsight bias, believing that an event that has already occurred was more likely to have happened than was true *ex ante* and could have been foreseen. Moreover, jurors make inaccurate judgments about the trade-off between risk and cost and tend to overestimate small risks and underestimate large risks. Jurors also show low comprehension and recall of explicit judicial instructions on the conditions necessary for punitive damages, instead substituting moral reasoning for legal standards. Due to these biases, there is a tendency for juries to find liability even when the defendant was not negligent and award higher punitive damages than warranted by the circumstances.

Jury selection of dollar awards for punitive damages is highly variable and unpredictable. Evaluating identical court cases, different experimental juries generally agree about whether the defendant's actions deserve punitive damages. However, lacking in clear instructions or standards for determining awards, individual jurors and juries may come to drastically different conclusions about an appropriate dollar award. In addition, juries are particularly susceptible to an anchoring effect, where their award decisions are influenced by arbitrary numbers, such as attorney arguments or financial status of the

defendant. Moreover, the deliberation process amplifies the variability of awards across jurors. This severity shift results in a final award that far exceeds the median award chosen by the individual jurors before deliberation.

While prone to the same biases exhibited by jurors, judges are generally more accurate in their assessments of liability and risk. Judges are less susceptible to hindsight bias and perform better than jurors in evaluating probabilities and risk. In awarding punitive damages, judges are better able to consider the risk-cost balance in order to determine an appropriate award amount.

On the other hand, there is empirical evidence that litigants are rational in their choice between a bench or jury trial, and choose the trial mode that maximizes their expected outcome. Using data on civil court cases terminated in federal courts from 1981-87, Hersch (2006) examines factors influencing the choice of trial forum and the impact of the forum decision on trial and settlement. Plaintiffs will request a jury trial when juries are more favorable towards plaintiffs and the win rate is higher as compared to bench trials. Plaintiffs are also more likely to request a jury trial when the damages demanded are larger and the variability of jury awards are higher. Both plaintiffs and defendants are more likely to choose a jury trial when litigation costs are lower for a jury trial relative to a bench trial. When a jury trial is chosen, cases are more likely to settle than a bench trial. The probability of settlement for a jury trial is 5.5 percent lower than if the right to a jury trial is waived.

References

- Adsera, Alicia, Boix, Charles, and Payne, Mark. 2003. "Are You Being Served? Political Accountability and the Quality of Government," 19 *Journal of Law, Economics, and Organization* 445-490.
- Akerlof, George A. 1970. "The Market for Lemons: Qualitative Uncertainty and the Market Mechanism," 84 *Quarterly Journal of Economics* 488-500.
- Amar, Akhil Reed. 1998. *The Bill of Rights: Creation and Reconstruction*. New Haven: Yale University Press.
- Andreoni, James. 1991. "Reasonable Doubt and the Optimal Magnitude of Fines: Should the Penalty Fit the Crime?" 22 *RAND Journal of Economics* 385-395.
- Atkins, Raymond A., and Rubin, Paul H. 2003. "Effects of Criminal Procedure on Crime Rates: Mapping Out the Consequences of the Exclusionary Rule," 46 *Journal of Law and Economics* 157-180.
- Ayres, Ian, and Donohue III, John J. 1999. "Nondiscretionary Concealed Weapons Laws: A Case Study of Statistics, Standards of Proof, and Public Policy", 1 *American Law and Economics Review* 436-470.
- Baiker, Katherine. 2004. "The Budgetary Repercussions of Capital Convictions," 4 *Advances in Economic Policy and Analysis* Article 6.
- Becker, Gary S. 1968. "Crime and Punishment: An Economic Approach," 76 *Journal of Political Economy* 169-217.
- Benham, Lee. 1972. "The Effect of Advertising on the Price of Eyeglasses," 15 *Journal of Law and Economics* 337-352.
- Bentham, Jeremy. 1825. *A Treatise on Judicial Evidence*. London: Quality Court.
- Besley, Timothy, and Prat, Andrea. 2006. "Handcuffs for the Grabbing Hand? Media Capture and Government Accountability," 96 *American Economic Review* 720-736.

- Brennan, Timothy J. 1995. "Game Theory and the First Amendment: Strategic Considerations and Freedom of the Press," in Brock, ed., *Toward a Competitive Telecommunication Industry* 307-329. New York: Erlbaum.
- Brennan, Timothy J., and Boyd, James W. 2006. "Political Economy and the Efficiency of Compensation for Takings," 24 *Contemporary Economic Policy* 188-202.
- Breton, Albert, and Wintrobe, Ronald. 1992. "Freedom of Speech vs. Efficient Regulation in Markets for Ideas," 17 *Journal of Economic Behavior and Organization* 217-239.
- Brunetti, Aymo, and Weder, Beatrice. 2003. "A Free Press is Bad News for Corruption," 87 *Journal of Public Economics* 1801-1824.
- Cannon, Bradley C. 1973. "Is the Exclusionary Rule in Failing Health? Some New Data and a Plea Against a Precipitous Conclusion," 62 *Kentucky Law Journal* 681-730.
- Calfee, John E. 1997. *Fear of Persuasion: A New Perspective on Advertising and Regulation*. Washington, DC: Agora Publishing and AEI Press.
- Caselli, Francesco, and Morelli, Massimo. 2004. "Bad Politicians," 88 *Journal of Public Economics* 759-782.
- Cassell, Paul G., and Fowles, Richard. 1998. "Handcuffing the Cops? A Thirty-Year Perspective on Miranda's Harmful Effects on Law Enforcement," 50 *Stanford Law Review* 1055-1145.
- Chowdhury, Shyamal K. 2004. "The Effect of Democracy and Press Freedom on Corruption: An Empirical Test," 85 *Economics Letters* 93-101.
- Coase, Ronald H. 1974. "The Economics of the First Amendment: The Market for Goods and the Market for Ideas," 64 *American Economic Review* 384-391.
- Coase, Ronald H. 1977. "Advertising and Free Speech," 6 *Journal of Legal Studies* 1-34.
- Cooter, Robert D. 2002. *The Strategic Constitution*. Princeton, NJ: Princeton University Press.
- Craswell, Richard. 1985. "Interpreting Deceptive Advertising," 65 *Boston University Law Review* 658-732.
- Darby, Michael R., and Karni, Edi. 1973. "Free Competition and the Optimal Amount of Fraud," 16 *Journal of Law and Economics* 67-88.
- Dezhbakhsh, Hashem, and Rubin, Paul H. 1998. "Lives Saved or Lives Lost: The Effect of Concealed Handgun Laws on Crime," 88 *American Economic Review* 468-474.
- Dezhbakhsh, Hashem, and Rubin, Paul H. 2003. "The Effect of Concealed Handgun Laws on Crime: Beyond the Dummy Variables," 23 *International Review of Law and Economics* 199-216.
- Dezhbakhsh, Hashem, and Rubin, Paul H. 2007. "From the 'Econometrics of Capital Punishment' to the 'Capital Punishment of Econometrics': On the Use and Abuse of Sensitivity Analysis," available at SSRN.
- Dezhbakhsh, Hashem, Rubin, Paul H., and Shepherd, Joanna M. 2003. "Does Capital Punishment Have a Deterrent Effect? New Evidence from Postmoratorium Panel Data," 5 *American Law and Economics Review* 344-376.
- Donohue III, John J. 1998. "Did Miranda Diminish Police Effectiveness?" 50 *Stanford Law Review* 1151-1162.

- Donohue III, John J., and Levitt, Steven D. 1998. "Guns, Violence, and the Efficiency of Illegal Markets," 88 *American Economic Review* 463-467.
- Donohue III, John J., and Levitt, Steven D. 2001. "The Impact of Race on Policing and Arrests," 44 *Journal of Law and Economics* 367-394.
- Donohue III, John J., and Wolfers, Justin. 2005. "Uses and Abuses of Empirical Evidence in the Death Penalty Debate," 58 *Stanford Law Review* 791-846.
- Eide, Erling, Rubin, Paul H., and Shepherd, Joanna M. 2006. *Economics of Crime*. Boston: Now Publishers.
- Ehrlich, Isaac. 1975. "The Deterrent Effect of Capital Punishment: A Question of Life and Death," 65 *American Economic Review* 397-417.
- Ehrlich, Isaac. 1977. "Capital Punishment and Deterrence: Some Further Thoughts and Additional Evidence," 85 *Journal of Political Economy* 741-788.
- Froeb, Luke M., and Kobayashi, Bruce H. 1996. "Naive, Biased, Yet Bayesian: Can Juries Interpret Selectively Produced Evidence?" 12 *Journal of Law, Economics, and Organization* 257-276.
- Gay, Gerald D., Grace, Martin F., Kale, Jayant R., and Noe, Thomas H. 1989. "Noisy Juries and the Choice of Trial Mode in a Sequential Signalling Game: Theory and Evidence," 20 *RAND Journal of Economics* 196-213.
- Gould, Jon B., and Mastrofski, Stephan D. 2004. "Suspect Searches: Assessing Police Behavior Under the U.S. Constitution," 3 *Criminology and Public Policy* 315-362.
- Grossman, Sanford. 1981. "The Informational Role of Warranties and Private Disclosure About Product Quality," 24 *Journal of Law and Economics* 461-483.
- Helland, Eric, and Tabarrok, Alexander. 2000. "Runaway Judges? Selection Effects and the Jury," 16 *Journal of Law, Economics, and Organization* 306-333.
- Helsley, Robert W., and O'Sullivan, Arthur. 2001. "Stolen Gun Control," 50 *Journal of Urban Economics* 436-447.
- Hersch, Joni. 2006. "Demand for a Jury Trial and the Selection of Cases for Trial," 35 *Journal of Legal Studies* 119-142.
- Hirshleifer, Jack. 1980. "Privacy, Its Origin, Function, and Future," 9 *Journal of Legal Studies* 649-666.
- Jordan, Ellen R. and Rubin, Paul H. 1979. "An Economic Analysis of the Law of False Advertising," 8 *Journal of Legal Studies* 527-553.
- Katz, Lawrence, Levitt, Steven D., and Shustorovich, Ellen. 2003. "Prison Conditions, Capital Punishment, and Deterrence," 5 *American Law and Economics Review* 318-343.
- Kessler, Daniel, and Levitt, Steven D. 1999. "Using Sentence Enhancements to Distinguish Between Deterrence and Incapacitation," 42 *Journal of Law and Economics* 343-364.
- Klein, Benjamin, and Leffler, Keith B. 1981. "The Role of Market Forces in Assuring Contractual Performance," 89 *Journal of Political Economy* 615-641.
- Kontorovich, Eugene. 2005. "The Constitution in Two Dimensions: A Transaction Cost Analysis of Constitutional Remedies," 91 *Virginia Law Review* 1135-1198.

- Landes, William M. 1978. "An Economic Study of U.S. Aircraft Hijacking, 1961-1976," 21 *Journal of Law and Economics* 1-31.
- Lott, John. 2000. *More Gun, Less Crime*. Second Edition, University of Chicago Press.
- Lott, John. 2006. "Campaign Finance Reform and Electoral Competition," 129 *Public Choice* 263-300.
- Lott, John R. Jr., and Mustard, David B. 1997. "Crime, Deterrence, and Right-to-Carry Concealed Handguns," 26 *Journal of Legal Studies* 1-68.
- Lynch, Michael, Miller, Ross M., Plott, Charles R., and Porter, Russell. 1986. "Product Quality, Consumer Information and 'Lemons' in Experimental Markets," in Pauline M. Ippolito and David T. Scheffman, eds., *Consumer Protection Economics* 251-306. Washington: Federal Trade Commission.
- Mathios, Alan, and Plummer, Mark. 1989. "The Regulation of Advertising by the Federal Trade Commission: Capital Market Effects," in Richard O. Zerbe, ed., Vol. 12 *Research in Law and Economics* 77-93.
- McChesney, Fred S. 1997. "A Positive Regulatory Theory of the First Amendment," in Richard A. Posner and Francesco Parisi, eds., Vol. 3 *Law and Economics* 475-502.
- McMillan, John, and Zoido, Pablo. 2004. "How to Subvert Democracy: Montesinos in Peru," 18 *Journal of Economic Perspectives* 69-92.
- Mialon, Hugo M. 2005. "An Economic Theory of the Fifth Amendment," 36 *RAND Journal of Economics* 833-848.
- Mialon, Hugo M., and Mialon, Sue H. 2008. "The Effects of the Fourth Amendment: An Economic Analysis," *Journal of Law, Economics, and Organization* Forthcoming.
- Mialon, Hugo M., and Wiseman, Tom. 2005. "The Impact of Gun Laws: A Model of Crime and Self-Defense," 88 *Economics Letters* 170-175.
- Miceli, Thomas J. 2004. *The Economic Approach to Law*. Stanford, CA: Stanford University Press.
- Milgrom, Paul R. 1981. "Good News and Bad News: Representation Theorems and Application," 12 *Bell Journal of Economics* 380-391.
- Mocan, H. Naci, and Gittings, R. Kaj. 2003. "Getting Off Death Row: Commuted Sentences and the Deterrent Effect of Capital Punishment," 46 *Journal of Law and Economics* 453-478.
- Mueller, Dennis C. 2004, "Rights and Citizenship in a World of Global Terrorism," 20 *European Journal of Political Economy* 335-348.
- Neilson, William S., and Winter, Harold. 2000. "Bias and the Economics of Jury Selection," 20 *International Review of Law and Economics* 223-250.
- Nelson, Philip. 1970. "Information and Consumer Behavior," 78 *Journal of Political Economy* 311-329.
- Nelson, Philip. 1974. "Advertising as Information," 82 *Journal of Political Economy* 729-754.
- Oaks, Dallin H. 1970. "Studying the Exclusionary Rule in Search and Seizure," 37 *University of Chicago Law Review* 665-757.

- Orfield Jr., Myron W. 1987. "The Exclusionary Rule and Deterrence: An Empirical Study of Chicago Narcotics Officers," 54 *University of Chicago Law Review* 1016-1069.
- Owen, Bruce M. 1974. "The Economics of the First Amendment: A Discussion," 64 *American Economic Review* 400-402.
- Palmer, John P., and Henderson, John. 1998. "The Economics of Cruel and Unusual Punishment," 5 *European Journal of Law and Economics* 235-245.
- Peltzman, Sam. 1981. "The Effects of FTC Advertising Regulation," 24 *Journal of Law and Economics* 403-448.
- Persson, Mats, and Siven, Claes-Henric. 2007. "The Becker Paradox and Type I vs. Type II Errors in the Economics of Crime," 48 *International Economic Review* 211-233.
- Polinsky, A. Mitchell, and Shavell, Steven. 1984. "The Optimal Use of Fines and Imprisonment," 24 *Journal of Public Economics* 89-99.
- Polinsky, A. Mitchell, and Shavell, Steven. 2000. "The Economic Theory of Public Enforcement of Law," 38 *Journal of Economic Literature* 45-76.
- Posner, Richard A. 1981. "The Economics of Privacy," 71 *American Economic Review* 405-409.
- Posner, Richard A. 1983. *The Economics of Justice*. Cambridge, Massachusetts: Harvard University Press.
- Posner, Richard A. 2006. *Not A Suicide Pact: The Constitution in a Time of National Emergency*. New York: Oxford University Press.
- Posner, Richard A. 2007. *The Economic Analysis of Law* Seventh Edition. New York, NY: Aspen Publishers.
- Rabinowitz, Dorothy. 2004. *No Crueler Tyrannies: Accusation, False Witness, and Other Terrors of Our Times*. New York: Wall Street Journal Book.
- Rasmusen, Eric. 1998a. "The Economics of Desecration: Flag Burning and Related Activities," 27 *Journal of Legal Studies* 245-269.
- Rasmusen, Eric. 1998b. "From Miranda to Mezzanatto: The Economics of Self-Incrimination," 19 *Cardozo Law Review* 1541-1584.
- Reinganum, Jennifer F. 1988. "Plea Bargaining and Prosecutorial Discretion," 78 *American Economic Review* 713-728.
- Rubin, Paul H. 1991. "Economics and the Regulation of Deception," 10 *Cato Journal* 667-690.
- Rubin, Paul H., and Lenard, Thomas M. 2002. *Privacy and the Commercial Use of Personal Information*. Progress and Freedom Foundation and Kluwer Academic Publishers.
- Schrag, Joel, and Scotchmer, Suzanne. 1994. "Crime and Prejudice: The Use of Character Evidence in Criminal Trials," 10 *Journal of Law, Economics, and Organization* 319-342.
- Seidmann, Daniel. 2005. "The Effects of a Right to Silence," 72 *Review of Economic Studies* 593-614.
- Shapiro, Carl. 1983. "Premiums for High Quality Products as Returns to Reputation," 98 *Quarterly Journal of Economics* 659-679.

- Shavell, Steven. 1987. "A Model of Optimal Incapacitation," 77 *American Economic Review* 107-110.
- Shavell, Steven. 1989. "Sharing Information Prior to Settlement or Litigation," 20 *RAND Journal of Economics* 183-195.
- Shavell, Steven. 1991. "Specific versus General Enforcement of Law," 99 *Journal of Political Economy* 1088-1108.
- Shepherd, Joanna M. 2005. "Deterrence versus Brutalization: Capital Punishment's Differing Impacts among States," 104 *Michigan Law Review* 203-255.
- Spulber, Daniel F. 1989. *Regulation and Markets*. Cambridge: MIT Press.
- Stigler, George J. 1970. "The Optimum Enforcement of Laws," 78 *Journal of Political Economy* 526-536.
- Stigler, George J. 1980. "An Introduction to Privacy in Economics and Politics," 9 *Journal of Legal Studies* 623-644.
- Sunstein, Cass R., Hastie, Reid, Payne, John W., Schkade, David A., and Viscusi, W. Kip. 2002. *Punitive Damages: How Juries Decide*. Chicago: University of Chicago Press.
- Taylor, Robert. 1995. "A Game Theoretic Model of Gun Control," 15 *International Review of Law and Economics* 269-288.
- Volokh, Alexander. 1997. "*n* Guilty Men," 146 *University of Pennsylvania Law Review* 173-216.
- Zimmerman, Paul R. 2004. "State Executions, Deterrence, and the Incidence of Murder," 7 *Journal of Applied Economics* 163-193.
- Zimmerman, Paul R. 2006. "Estimates of the Deterrent Effect of Alternative Execution Methods in the United States: 1978-2000," 65 *American Journal of Economics and Sociology* 909-942.