

## NOTE

### COPYRIGHT INFRINGEMENT AND THE INTERNET: AN ECONOMIC ANALYSIS OF CRIME

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#### I. INTRODUCTION

More than ever before, lawmakers and copyright owners are viewing copyright violations as not just lost profits or “free riding” by consumers, but rather as criminal acts posing a serious threat to financial stability, employment, and creative innovation.<sup>1</sup> Technological advances such as high-

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<sup>1</sup> See Karen J. Bernstein, *Net Zero: The Evisceration of the Sentencing Guidelines Under the No Electronic Theft Act*, 27 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 57, 59-62 (2001) (discussing law enforcement’s inability to prosecute criminal copyright infringers under early copyright statutes and the consequences of copyright infringement, including lost jobs, uncollected taxes, lost revenue, and reduced innovation); Don E. Tomlinson, *Intellectual Property in the Digital Age: The Piracy/Counterfeiting Problem and Antipiracy and Anti-counterfeiting Measures*, 8 CURRENTS: INT’L TRADE L.J. 3, 3 (1999) (estimating the total economic loss due to piracy at “anywhere from \$2.8 billion per year to \$12.4 billion per year”). See also Melissa A. Kern, *Paradigm Shifts and Access Controls: An Economic*

speed Internet connections and media encoding technologies have enabled copyright pirates to steal more efficiently.<sup>2</sup> As policymakers increasingly see piracy as a criminal act, they naturally look to criminal theories for assistance in their counterefforts. One such theory is the economic model of crime. The basic foundations of this theory are exemplified by economist Gary Becker:

The approach taken here follows the economists' usual analysis of choice and assumes that a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and resources at other activities. Some persons become "criminals," therefore, not because their basic motivation differs from that of other persons, but because their benefits and costs differ.<sup>3</sup>

Numerous authors have criticized or examined this economic analysis of crime,<sup>4</sup> and many authors and legal scholars have examined the economic implications of recent anti-piracy laws in the context of Internet piracy.<sup>5</sup> However, despite the recent proliferation of criminal statutes concerning copyright infringement, no author has yet applied the economic model of crime directly to Internet piracy.

This Note considers various sources of economic criminal theory in order to

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*Analysis of the Anticircumvention Provisions of the Digital Millennium Copyright Act*, 35 U. MICH. J.L. REFORM 891, 924 (2002) (defining piracy as "unauthorized and illegal reproduction or distribution of materials protected by copyright").

<sup>2</sup> See Tomlinson, *supra* note 1, at 3 ("[W]hile technological advances in the 'digital domain' have made the creation, storage, and marketing of much of intellectual property much better, these same technological advances have made the life of the intellectual-property pirate much better, too, because of the 'storage' part of the equation.").

<sup>3</sup> Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 176 (1968).

<sup>4</sup> See generally Alvin K. Klevorick, *On the Economic Theory of Crime*, in NOMOS XXVII: CRIMINAL JUSTICE 289 (J. Roland Pennock & John W. Chapman eds., 1985); William L. Barnes, Jr., *Revenge on Utilitarianism: Renouncing a Comprehensive Economic Theory of Crime and Punishment*, 74 IND. L.J. 627 (1999); Kenneth G. Dau-Schmidt, *An Economic Analysis of the Criminal Law as a Preference-Shaping Policy*, 1990 DUKE L.J. 1; Dan M. Kahan, *Between Economics and Sociology: The New Path of Deterrence*, 95 MICH. L. REV. 2477 (1997) [hereinafter Kahan, *Between Economics and Sociology*]; Dan M. Kahan, *Social Influence, Social Meaning, and Deterrence*, 83 VA. L. REV. 349 (1997) [hereinafter Kahan, *Social Influence*]; Neal Kumar Katyal, *Deterrence's Difficulty*, 95 MICH. L. REV. 2385 (1997).

<sup>5</sup> See generally Bernstein, *supra* note 1, at 59-62; Kern, *supra* note 1, at 924; Matthew C. Mousley, Note, *Peer-To-Peer Combat: The Entertainment Industry's Arsenal in its War on Digital Piracy*, 48 VILL. L. REV. 667 (2003); Shahram A. Shayesteh, *High-Speed Chase on the Information Superhighway: The Evolution of Criminal Liability for Internet Piracy*, 33 LOY. L.A. L. REV. 183 (1999); Note, *The Criminalization of Copyright Infringement in the Digital Era*, 112 HARV. L. REV. 1705 (1999) [hereinafter *The Criminalization of Copyright Infringement*].

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construct two new conceptual models: the microeconomic (the choice facing each individual) and macroeconomic (the choice facing society) models of crime.<sup>6</sup> Instead of simply using existing models,<sup>7</sup> this Note applies the lessons of Becker's model to copyright infringement, adapting these two related models of crime based on the elements most relevant to the crime of Internet piracy.<sup>8</sup> This Note then applies each of the models' elements to Internet-based copyright infringement to understand how the various strategies used by copyright owners and legislators interact with the criminal model and then to predict which of these strategies will or will not succeed.

Part II of this Note will outline the relevant copyright infringement issues and identify the actors and transactions involved. Part III will introduce the economic analysis of crime and explore the microeconomic and macroeconomic models, applying each element to the relevant law or copyright owner actions to explain in economic terms the incentives that current policies create. Part IV will address various criticisms of the traditional economic model. Finally, Part V will explore behavioral economic issues to further explain how potential perpetrators behave in the face of criminal statutes.

## II. COPYRIGHT INFRINGEMENT ISSUES

This Note focuses on the use of the Internet to acquire or disseminate infringing copies of copyrighted works, particularly music, software, and motion pictures. Recent technological advances such as music and video compression and high-speed Internet connections have helped make the legal storage and dissemination of such works more efficient and marketable.<sup>9</sup> However, these continuing advances have also enabled more effective and profitable piracy.<sup>10</sup> It is no surprise that Internet piracy is the fastest growing

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<sup>6</sup> See, e.g., Barnes, *supra* note 4, at 638 (discussing three primary strands of thought with respect to the economic analysis of crime: "The Optimal Criminal Justice Policy" (the macroeconomic model below), "The Individual's Decision About Criminal Activity" (the microeconomic model below), and "The Existence of the Criminal Category" (this strand is associated with the theory that criminal law is needed to prevent individuals from bypassing market transactions, but is not considered by this Note)).

<sup>7</sup> See, e.g., Becker, *supra* note 3.

<sup>8</sup> While these models were constructed with prior knowledge of Becker's model, they are not simply modifications of those existing models, but instead have been constructed de novo with the abovementioned goals. See *id.* at 180-85 (laying out Becker's extensive model).

<sup>9</sup> See Tomlinson, *supra* note 1, at 3; *The Criminalization of Copyright Infringement*, *supra* note 5, at 1712.

<sup>10</sup> See Tomlinson, *supra* note 1, at 3; *The Criminalization of Copyright Infringement*, *supra* note 5, at 1712.

form of piracy and the most difficult to police.<sup>11</sup> Consequently, lawmakers have been attempting to keep up with changes in technology by constantly enacting new copyright protection statutes that counter the most recent threat to copyright owners.<sup>12</sup>

The primary actors in this scenario are the government, copyright owners, infringers, and consumers. Those involved with Internet piracy may take the form of sellers, buyers, sharers, or downloaders. The actors involved may seek commercial gain, fame for distributing an infringing copy, or just free music.<sup>13</sup> Whatever the act or motive, copyright lawmakers must continually find ways to prevent and punish copyright infringers, especially as technology makes piracy more feasible for a larger portion of the population, both through internet access and software advancements.<sup>14</sup> The three most problematic types of copyrighted works are music, software,<sup>15</sup> and motion pictures<sup>16</sup> but this Note will focus only on those infringement transactions that occur over the Internet. Once a work is downloaded, any subsequent copying or dissemination in physical form is well within the scope of traditional, bricks-and-mortar piracy.<sup>17</sup> Consequently, most transactions encompassing “Internet piracy” do not involve a goods-for-money transfer, but instead may involve a barter of one copyrighted good for another.<sup>18</sup> This is a prominent issue on

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<sup>11</sup> See Douglas Heingartner, *Software Piracy Is in Resurgence, With New Safeguards Eroded by File Sharing*, N.Y. TIMES, Jan. 19, 2004, at C9 (discussing difficulties in policing the Internet).

<sup>12</sup> See, e.g., No Electronic Theft Act, Pub. L. No. 105-147, 111 Stat. 2678 (1997); Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (1998).

<sup>13</sup> See Shayesteh, *supra* note 5, at 192 (“Software pirates normally fall into one of three categories: (1) organized pirates, consisting of hackers who copy on a large scale and usually for profit; (2) individual computer users, who copy software from the Internet, friends, or colleagues in order to avoid paying its retail price; and (3) corporate employees, individuals in the workplace who copy unlicensed software, with or without management approval.”) (citations omitted); Tomlinson, *supra* note 1, at 4 (“In cyberspace, there are a variety of ways that the piracy of sound can occur; it is important to remember that not all pirates have large (or even small) economic goals in mind. Some of them simply may want to be ‘cool,’ and they may lack the mens rea to be willful infringers, but the nature of their actions would seem to make them copyright pirates nonetheless.”) (citations omitted).

<sup>14</sup> See Heingartner, *supra* note 11.

<sup>15</sup> See *id.*

<sup>16</sup> See John Schwartz, *Is Legal Action Against File Swappers Good Business?*, N.Y. TIMES, Sept. 15, 2003, at C1.

<sup>17</sup> From this point on in the enterprise, the work can be duplicated for distribution to acquaintances for no consideration or for commercial sale to other individuals. See, e.g., Linda Lee, *Bootleg Videos: Piracy With a Camcorder*, N.Y. TIMES, July 7, 1997, at D1 (describing the pirated motion picture industry in New York City).

<sup>18</sup> Copies are often transferred for consideration other than money, primarily access to infringing copies of other works. See, e.g., Peter H. Lewis, *Student Accused of Running*

which many recent statutes have focused.<sup>19</sup>

There are significant differences between copyright infringement and most other types of crime. Although intellectual property piracy is in some ways analogous to traditional property crimes, it also differs from most crimes because anti-piracy enforcement and criminal regulation tend to be the result of coordination between the government and the rightful property owners.<sup>20</sup> While property owners are able to implement some solutions (“market solutions”),<sup>21</sup> government action is still required for others (“legal solutions”).<sup>22</sup>

The legal solutions generally consist of statutes aimed at criminalizing behavior that lawmakers believe to infringe upon the rights of copyright holders.<sup>23</sup> The market solutions include technological features that allow copyright holders to exert control over their works,<sup>24</sup> such as copy-protection,<sup>25</sup> as well as strategies to create legal methods of Internet-based acquisition of copyrighted goods like online digital music purchases on services such as iTunes or the new, legal version of Napster.<sup>26</sup> Technological advances have

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*Network for Pirated Software*, N.Y. TIMES, Apr. 9, 1994, at A1 (describing U.S. v. LaMacchia, 871 F. Supp. 535 (D. Mass. 1994), in which a student turned “computers into electronic bulletin boards on which Internet users could place copies of commercial programs, allowing other users to receive illegal copies.”).

<sup>19</sup> For example, the NET Act criminalized dissemination of unauthorized works despite lack of profit motive, and the DMCA criminalized trafficking in circumvention devices. See *supra* note 12.

<sup>20</sup> See, e.g., Jeri Clausing, *Software Makers Ask for Protection From Internet Piracy*, N.Y. TIMES, June 8, 2000, at C2 (discussing the Business Software Alliance’s efforts in lobbying Congress for better enforcement of copyright statutes). See also George J. Stigler, *The Optimum Enforcement of Laws*, 78 J. POL. ECON. 526, 528 (1970) (“There is a division of labor between the state and the citizen in the prevention of virtually any offense.”).

<sup>21</sup> See Becker, *supra* note 3, at 200-01 (discussing private expenditures on crime prevention). This generally refers to “self-help” and private enforcement / prevention, such as locks on doors, fences, security systems, and the like. Intellectual property owners can enact the digital equivalents of those devices to protect their works.

<sup>22</sup> See Mousley, *supra* note 5, at 682-95 (discussing different approaches to Internet, or “digital,” piracy).

<sup>23</sup> See *supra* note 13.

<sup>24</sup> See Mousley, *supra* note 5, at 689.

<sup>25</sup> See, e.g., Aljean Harmetz, ‘Cotton Club’ Cassettes Coded To Foil Pirates, N.Y. TIMES, Apr. 24, 1985, at C15 (discussing “Macrovision” copy-protection for videocassette tapes); Amy Harmon, *Piracy, or Innovation? It’s Hollywood vs. High Tech*, N.Y. TIMES, Mar. 14, 2002, at C1 (discussing copy-protection issues in general, and the difficulty in creating a system that cannot be cracked); Mousley, *supra* note 5, at 689-92 (discussing copy-protection technology used in DVDs and CDs, commercial Peer to Peer networks, and software activation schemes).

<sup>26</sup> See Amy Harmon, *Grudgingly, Music Labels Sell Their Songs Online*, N.Y. TIMES,

not only established better control over copyrighted content through software or hardware based anti-piracy measures,<sup>27</sup> but they have also helped copyright owners more efficiently search for and prosecute infringers.<sup>28</sup> This Note will consider various methods of combating copyright infringement, both market-based and legally-based, to illuminate the interaction among copyright owners, legislators, and the criminal aspects of the copyright laws.

### III. THE ECONOMIC MODELS OF CRIME

#### A. Introduction

With his groundbreaking 1968 paper, *Crime and Punishment: An Economic Approach*, University of Chicago economist Gary Becker was the first to use economic theory to analyze criminal law.<sup>29</sup> Becker's paper was a mathematically rigorous work, but this Note will strive to simplify Becker's theories and models into a form that can be practically applied to copyright

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July 1, 2002, at C1 (noting Universal Music Group's licensing to Listen.com and Warner's licensing to MusicNet and FullAudio and the fact that labels are being forced to license their music to online services and allow more flexibility with downloaded tracks to lure customers away from illegal downloading sites and to legitimate services); Bob Tedeschi, *Music at Your Fingertips, but a Battle Among Those Selling It to You*, N.Y. TIMES, Dec. 1, 2003, at C21 (discussing the competition between online music sellers such as Apple's iTunes, RealNetworks' Rhapsody, Napster of Roxio, MusicMatch, BuyMusic.com, and BestBuy).

<sup>27</sup> See, e.g., David Sharos, *Music Companies Singing Praises of New Audio Discs*, CHI. TRIB., Mar. 20, 2004, at C3 (discussing two new formats of audio compact discs: Super Audio Compact Discs, "which may include a regular CD of an album plus a second layer that can be read only by a special SACD player," and DVD-audio, which "is built on the same platform as a movie video and includes extra goodies like read-along song lyrics, biographies and music videos," neither of which can be effectively copied without compromising the work's resolution). But see Mousley, *supra* note 5, at 689 (discussing the failure of copy-protected compact discs due to their incompatibility with many CD players); Ida Shum, Note, *Getting "Ripped" Off by Copy-Protected CDs*, 29 J. LEGIS. 125, 125-26 (2002) (discussing consumer suits alleging unfair business practices over a type of copy protection because the package failed to disclose to potential purchasers that the CD could not be played on a computer).

<sup>28</sup> See *The Criminalization of Copyright Infringement*, *supra* note 5 at 1720-21 (quoting Mark Gimbel, Note, *Some Thoughts on the Implications of Trusted Systems for Intellectual Property Law*, 50 STAN. L. REV. 1671, 1672 (1998)) (noting that digital technology enables copyright owners to have "a level of control over copyrighted works that the law has been not only unable but unwilling to provide" and that "[c]opyright owners can run searches on the Internet that can detect unauthorized copies, a process that is much less costly than searching homes, stores, and workplaces for evidence of infringing copies") (citations omitted).

<sup>29</sup> See Becker, *supra* note 3.

law.<sup>30</sup> Economic analysis of criminal law focuses on the utilitarian or “deterrence” theory.<sup>31</sup> Deterrence theory suggests that criminal law should be designed to prevent crime *ex ante*, instead of merely seeking to punish *ex post*, under the assumption that potential criminals will choose their course of action based on the expected consequences.<sup>32</sup>

Although criminal scholars generally spend little time pondering economic theories, their work can be helpful when analyzing efficient and practical enforcement of criminal law.<sup>33</sup> Becker’s paper focused particularly on the macroeconomic model of crime: the problem which society faces when engineering a criminal law designed to minimize both crime and the costs of enforcement.<sup>34</sup> Included within this model, however, was also a microeconomic model of crime: the problem an individual faces when he or she chooses whether to commit a certain crime.<sup>35</sup>

Later developments by economist George Stigler<sup>36</sup> and Richard Posner<sup>37</sup> explored the policy issues involved in creating an optimal criminal law enforcement scheme. Stigler focused on Becker’s goal of designing an optimal criminal law<sup>38</sup> and Posner concentrated on what he saw as the law’s function of persuading criminal transactions (i.e., coercive transfers) into their corresponding legal markets.<sup>39</sup> Posner introduced the view that crimes are merely potentially legitimate transfers that, because they were committed

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<sup>30</sup> *See id.* This Note does not discuss, as Becker did, empirical analyses of the crimes discussed insofar as actual costs of crime and costs of enforcement are involved.

<sup>31</sup> *See* Dau-Schmidt, *supra* note 4, at 3-5.

<sup>32</sup> *See id.*

<sup>33</sup> *See* Stephen J. Schulhofer, *Is there an Economic Theory of Crime?*, in NOMOS XXVII: CRIMINAL JUSTICE 329, 330 (J. Roland Pennock & John W. Chapman eds., 1985) (“[L]egal scholars must also accept that the problem of protecting society from crime while protecting offenders from unnecessarily stringent sanctions, that is, the problem of optimal resource allocation, is central to the work they should be doing. Thus, the work and interests of many criminal justice scholars is seriously incomplete.”).

<sup>34</sup> *See* Becker, *supra* note 3, at 169; Klevorick, *supra* note 4, at 292 (stating that Becker was “concerned with cost-benefit analysis at the social level”).

<sup>35</sup> *See* Becker, *supra* note 3, at 169.

<sup>36</sup> *See* Stigler, *supra* note 20, at 527 (commenting on Becker’s 1968 paper and exploring further the theory of an optimal rate of crime).

<sup>37</sup> *See* RICHARD POSNER, AN ECONOMIC ANALYSIS OF LAW, 237-70 (5th ed. 1998) (bringing together the various theories in a survey of the field); Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 COLUM. L. REV. 1193 (1985) (contributing his theory on the purpose of criminal law and a substantial policy analysis).

<sup>38</sup> *See* Stigler, *supra* note 20, at 526-27.

<sup>39</sup> *See* POSNER, *supra* note 37, at 15 (arguing that preventing coercive transfers and encouraging voluntary transfers on the market is efficient). *See also* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 434 (3d ed. 2000).

without the consent of parties involved, are inefficient and thus undesirable.<sup>40</sup>

In general, economic models of crime advocate three primary concepts: (1) deterrence, (2) marginal deterrence, and (3) optimal enforcement. Deterrence theory assumes that the decision to commit a given crime is based not on a predetermined criminal status or mental state, but a rational appraisal of the costs and benefits associated with that decision.<sup>41</sup> Marginal deterrence, on the other hand, focuses on the relative punishments between different, fungible crimes in an attempt to encourage criminals towards less socially costly crimes.<sup>42</sup> This concept can apply to different crimes, such as attempted murder and murder, or more applicably, to copyright infringement, or to different degrees of the same crime, such as possession of varying amounts of a controlled substance.<sup>43</sup> Optimal enforcement focuses on the overall social costs of crime as well as the costs of criminal enforcement to best allocate resources to make society better off as a whole.<sup>44</sup> This Note borrows selectively from each of the above models and theories and selects the most useful elements from each in order to analyze Internet-based copyright infringement crimes.

#### *B. The Microeconomic Model of Crime*

The basic microeconomic model of crime—the problem faced by an individual when deciding whether to commit a certain crime—can be represented by the following equation:<sup>45</sup>

$$(1) P_1S < G$$

*Such that:*

$P_1$  = probability of apprehension, as believed by the perpetrator

$S$  = sentence if apprehended

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<sup>40</sup> See POSNER, *supra* note 37, at 15, 237-42.

<sup>41</sup> See Becker, *supra* note 3, at 176; Katyal, *supra* note 4, at 2389.

<sup>42</sup> See POSNER, *supra* note 37, at 245. Most copyright statutes already adhere to the concept of marginal deterrence as far as different punishments are meted out for different quantities of trafficked goods, and it is much less controversial than deterrence theory, so this issue will be given less attention in this Note.

<sup>43</sup> See *id.* This second example is more applicable to copyright infringement, particularly with respect to the quantity and retail value of the copyrighted works that were infringed upon.

<sup>44</sup> See Stigler, *supra* note 20, at 526-27.

<sup>45</sup> This model applies the lessons of Becker's model to copyright infringement. See Becker, *supra* note 3, at 176-79 (Becker's original model); Katyal, *supra* note 4, at 2409-11 (1997) (using a simplified model); Posner, *supra* note 37, at 1203-05 (also using a simplified version of Becker's model).

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$G = \text{expected gain from the crime}$

This is a deterrence-based model; it attempts to reflect the incentives and disincentives facing potential perpetrators and determine if those costs and benefits of a crime will deter people from committing the crime.<sup>46</sup> This model also assumes that the perpetrator will weigh rationally the costs and benefits of a given crime before deciding whether to act,<sup>47</sup> with the implication that if the perpetrator is risk neutral<sup>48</sup> and  $P_1S < G$ , then he will commit that crime.<sup>49</sup>

*Probability of Apprehension:  $P_1$*

This factor represents the probability, in the mind of the potential perpetrator, of apprehension and subsequent conviction if he commits a given crime.<sup>50</sup>  $P_1$  is not necessarily the actual probability of apprehension and conviction,<sup>51</sup> but only the potential perpetrator's perception thereof. Because of this, enforcement policies that increase probability of conviction but are not publicly known are less likely to affect criminal behavior than those that attempt to communicate directly with potential perpetrators.<sup>52</sup> Consequently, high-profile enforcement methods may actually deter more crime than do

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<sup>46</sup> See Katyal, *supra* note 4, at 2389; Klevorick, *supra* note 4, at 291.

<sup>47</sup> See Barnes, *supra* note 4, at 640-41 (discussing the rationality assumption and its advantages and disadvantages); Steven D. Levitt, *The Effect of Prison Population Size on Crime Rates: Evidence From Prison Overcrowding Litigation*, 111 Q.J. ECON. 319 (1996); POSNER, *supra* note 37, at 243 (citing Isaac Ehrlich, *Crime, Punishment, and the Market for Offenses*, 10 J. ECON. PERSPECTIVES 43, 55-63 (Winter 1996)); D.J. Pyle, *The Economic Approach to Crime and Punishment*, 6 J. INTERDISCIPLINARY STUD. 1, 4-8 (1995).

<sup>48</sup> See *infra* Part IV.C for a discussion of risk neutrality.

<sup>49</sup> See Jules L. Coleman, *Crimes, Kickers, and Transaction Structures*, in NOMOS XXVII: CRIMINAL JUSTICE 313, 314 (J. Roland Pennock & John W. Chapman eds., 1985); POSNER, *supra* note 37, at 242.

<sup>50</sup> While Becker assumed that the actual probability of apprehension and conviction was always known by offenders, this paper will distinguish between actual and perceived probability of conviction for greater realism and to relate the discrepancy to efforts by copyright owners. See Becker, *supra* note 3, at 174-79. See also *infra* Part III.B. Note that as the perpetrator's activity level increases, the overall  $P_1$  will also increase, so the above model can be viewed not just for the decision to commit each criminal act, but also as for the overall criminal activity level. See Stigler, *supra* note 20, at 530.

<sup>51</sup> That probability is represented by  $P_2$  in the macroeconomic model. See *infra* Part III.B.

<sup>52</sup> See Klevorick, *supra* note 4, at 291 (citing Philip J. Cook, *A Unified Treatment of Deterrence, Incapacitation, and Rehabilitation: A Simulation Study* (Durham, N.C.: Institute of Policy Sciences and Public Affairs, Duke University, 1979)) ("[T]he threats that the criminal justice system poses for the criminal are communicated to the actor through the media, the visible presence of enforcers (for example, police), and personal experience and observation.").

methods with higher actual rates of conviction.<sup>53</sup>

For Internet piracy, this is a significant factor. One reason for the pervasiveness of Internet piracy is the relative anonymity of Internet-based file transfers.<sup>54</sup> Unlike traditional piracy, which necessarily involves person-to-person interaction, piracy through the Internet requires much less personal exposure to risk of apprehension.<sup>55</sup> In response, copyright owners have attempted to reduce anonymity by tracking infringers through their Internet service providers,<sup>56</sup> and then filing public suits against those individuals.<sup>57</sup> For example, the Recording Industry Association of America (“RIAA”) has subpoenaed Internet Service Providers for personal information about alleged Internet pirates, as identified by their IP addresses, and then sued those individuals.<sup>58</sup> This strategy publicizes prosecution of copyright infringement in an attempt to increase each individual’s value for  $P_1$ .<sup>59</sup> The campaign initially appeared successful in deterring individuals from downloading infringing digital copies of music. For example, online surveys have reported dramatic decreases in the number of individuals downloading unauthorized copies of digitized music.<sup>60</sup> However, this strategy has since faced new obstacles<sup>61</sup> and criticism within the industry.<sup>62</sup>

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<sup>53</sup> See Lawrence W. Sherman, *The Police*, in CRIME 327, 327-48 (James Q. Wilson & Joan Petersilia eds., 1995) (discussing police visibility, but suggesting that specific police activities are more important than their visibility).

<sup>54</sup> See Shayesteh, *supra* note 5, at 184.

<sup>55</sup> See *id.*; Teddy C. Kim, Note, *Taming the Electronic Frontier: Software Copyright Protection in the Wake of United States v. LaMacchia*, 80 MINN. L. REV. 1255, 1266 (1996).

<sup>56</sup> The District of Columbia District Court found that the RIAA could subpoena names of customers suspected of infringement. *Recording Indus. Ass’n of Am. v. Verizon Internet Servs.*, 2003 U.S. App. LEXIS 11250 (D.C. Cir. June 4, 2003). By July 2003, “the RIAA sent out close to 1,000 subpoenas requesting information from Internet Service Providers in order to identify . . . potential copyright infringers.” Mary Madden & Amanda Lenhart, *Music Downloading, File-sharing and Copyright: A Pew Internet Project Data Memo*, Pew Internet & American Life Project (July 2003), available at [http://www.pewinternet.org/pdfs/PIP\\_Copyright\\_Memo.pdf](http://www.pewinternet.org/pdfs/PIP_Copyright_Memo.pdf) (last visited Apr. 28, 2005).

<sup>57</sup> See Lee Rainie et al., *The Impact Of Recording Industry Suits Against Music File Swappers: A Pew Internet Project And Comscore Media Metrix Data Memo 1*, Pew Internet & American Life Project (Jan. 2004), available at [http://www.pewinternet.org/pdfs/PIP\\_File\\_Swapping\\_Memo\\_0104.pdf](http://www.pewinternet.org/pdfs/PIP_File_Swapping_Memo_0104.pdf) (last visited Apr. 28, 2005).

<sup>58</sup> See *supra* note 56.

<sup>59</sup> See, e.g., Saul Hansell, *Aiming at Pornography to Hit Music Piracy*, N.Y. TIMES, Sept. 7, 2003, at A1 (stating that the RIAA was “trying to turn up the heat on those who continue to download songs without paying for them” when it publicly stated that “it was going to start filing hundreds of lawsuits against individuals accused of swapping large numbers of copyrighted songs.”).

<sup>60</sup> See Rainie et al., *supra* note 57, at 1.

<sup>61</sup> *Recording Indus. Ass’n of Am. v. Verizon Internet Servs.*, 2003 U.S. App. LEXIS

*Sentence if Apprehended: S*

Punishment can include incarceration, fines, probation, or other social costs such as stigmatization by peers or a community.<sup>63</sup> S represents the overall disutility suffered by the perpetrator, regardless of the type of punishment administered.<sup>64</sup> This disutility can be very large, such as when freedom is lost due to incarceration,<sup>65</sup> or it can be smaller, such as from probation.<sup>66</sup> The disutility of fines is intuitively the most simple to determine, and since fines are essentially a transfer of utility from the perpetrator to society, they impose less deadweight loss than other punishments.<sup>67</sup> On the other hand, if the punishment is incarceration, not only does society gain nothing from the inmate's misery, but society must also expend resources to keep him incarcerated.<sup>68</sup>

The two most relevant modern statutes that establish penalties for copyright infringement are the 1997 No Electronic Theft ("NET") Act<sup>69</sup> and the 1998 Digital Millennium Copyright Act ("DMCA").<sup>70</sup> The NET Act extends criminal sanctions to actions not previously considered criminal, such as

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25735 (D.C. Cir. Dec. 19, 2003) had remanded the original case with instructions to vacate its order to enforce a subpoena, based on its conclusion that these subpoenas were not authorized under the DMCA. *See id.* at 10-19. In addition, studies have indicated that the number of households downloading music illegally increased by 6% in October 2003 and 7% in November 2003 after the previous six-month decline. *See Report: Illegal Downloading Rose After Suits*, CHI. TRIB. REDEYE ED., Jan. 16, 2004, at 8; The Associated Press, *Illegal Music Downloading Climbs*, N.Y. TIMES, Jan. 16, 2004.

<sup>62</sup> *See, e.g.,* Sharos, *supra* note 28 (Sony executive David Kawakami's argues that "developing a better product is a more effective strategy to combat piracy. The music industry's decision to sue individuals for illegal file sharing is 'a Prohibition-like measure that doesn't address the real problem . . . After 20 years of delivering yeoman's service, the CD is no longer competitive. The music industry needs to replace it with something that offers more value.'").

<sup>63</sup> *See* Katyal, *supra* note 4, at 2397-2400, 2453-55 (discussing stigmatization as informal criminal sanctions). This issue will be explored further in Part V.B.

<sup>64</sup> *See* POSNER, *supra* note 37, at 246.

<sup>65</sup> *See* Posner, *supra* note 37, at 1209; Kenneth Wolpin, *An Economic Analysis of Crime and Punishment in England and Wales, 1894-1967*, 86 J. POL. ECON. 815, 826 (1978).

<sup>66</sup> This includes the potentially costly result that criminal pursuits in the near future will be more severely punished and thus made more costly. *See* Wolpin, *supra* note 65, at 826 (finding that probation provides more deterrence than fines but less than incarceration).

<sup>67</sup> *See id.*; Becker, *supra* note 3, at 180; *infra* Part III.C (discussion of [C(S)]). *But see* Posner, *supra* note 37, at 1208 ("The stigma effect of a fine (as of any criminal penalty), noted earlier, is not transferred either.").

<sup>68</sup> *See* Posner, *supra* note 37, at 1209.

<sup>69</sup> Pub. L. No. 105-147, 111 Stat. 2678-80 (codified as amended at 17 U.S.C. § 506, 18 U.S.C. § 2319, 28 U.S.C. § 994) (1997).

<sup>70</sup> Pub. L. No. 105-304, 112 Stat. 2860 (1998).

infringement for noncommercial purposes but still in exchange for consideration,<sup>71</sup> and imposes maximum penalties of one to three years in prison, a fine of \$100,000 to \$250,000, or both, depending on the retail value of the infringing works.<sup>72</sup> The DMCA extends protection to circumvention of copyright protection systems and tampering with copyright management information,<sup>73</sup> and imposes five years of prison and a fine of \$500,000 for first time offenders and up to ten years of prison and a \$1,000,000 fine for repeat offenders who infringe for commercial gain.<sup>74</sup>

In addition to criminalizing actions not previously considered infringement, both of these statutes imposed much harsher penalties than then-existing traditional infringement laws, and thereby significantly raise S. To compensate for perceived shortcomings in the NET Act's sentencing guidelines,<sup>75</sup> Congress subsequently passed the Digital Theft Deterrence and Copyright Damages Improvement Act of 1999 ("Digital Theft Act"),<sup>76</sup> to increase statutory penalties by fifty percent and authorized harsher guidelines for assessing the value of infringing works.<sup>77</sup> It is clear, both from its provisions and from the title itself, that the purpose behind the Digital Theft Act was to bolster S to increase the deterrent effect of the copyright statute. The recent Family Entertainment and Copyright Act of 2005 continues this trend.<sup>78</sup>

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<sup>71</sup> The NET Act criminalizes infringement not only for financial gain (such as for commercial purposes) but also whenever "anything of value" is gained from the transaction and for the reproduction or distribution of over \$1000 (retail value) worth of copyrighted works. See 17 U.S.C. § 101 (2000) (definition of "financial gain"). See also 17 U.S.C. § 506(a)(2) (2000). The NET Act also makes it a crime to provide to others ten or more electronic copies of copyrighted works within a six-month period, regardless of motive. See *id.*

<sup>72</sup> See 18 U.S.C. §§ 2319(c)(1), (c)(3) (2000).

<sup>73</sup> See 17 U.S.C. §§ 1201-1202, 1204 (2000).

<sup>74</sup> These enhanced penalties apply to perpetrators who act "willfully and for purposes of commercial advantage or private financial gain," as opposed to, for example, merely seeking an infringing copy for personal use. 17 U.S.C. § 1204(a)(1).

<sup>75</sup> See Bernstein, *supra* note 1, at 73.

<sup>76</sup> Pub. L. No. 106-160, 113 Stat. 1774 (1999) (codified as amended at 17 U.S.C. § 504(c), 28 U.S.C. § 994 (2000)).

<sup>77</sup> See *id.*; Bernstein, *supra* note 1, at 73-74 (explaining how the new guidelines implement the full retail value, not the market value, of infringing goods). However, the Department of Justice cautioned about the "likelihood that relying on the price of the infringed-upon item may lead to an inappropriately high economic harm calculation where there is a dramatic price differential between the genuine and illegal products." See Sentencing Guidelines for the United States Courts, 64 Fed. Reg. 72, 129-30 (Dec. 23, 1999).

<sup>78</sup> See Pub. L. No. 109-9, §§ 102-103, 119 Stat. 218, 218-221 (2005) (increasing penalties for unauthorized recording of motion pictures and criminal infringement of works

*Expected Gain from the Crime: G*

This factor reflects what the prospective perpetrator expects to gain by committing this crime in lieu of undertaking other more socially productive activities.<sup>79</sup> In other words, G considers the opportunity costs of the crime.<sup>80</sup> The more complex and time-consuming the criminal act is, the more time and effort the perpetrator could redirect to legal activities that also bring about a gain in utility, such as legal employment.<sup>81</sup> Thus, G can be considered the net gains of the crime over the legal alternatives.<sup>82</sup> For example, with respect to Internet piracy by potential consumers, G represents the net gain of illegally obtaining a copyrighted good instead of legally purchasing it:

$$(2) G = C(x) - V(x)$$

*Such that:*

$C(x)$  = cost of obtaining good  $x$  (selling price)

$V(x)$  = cost of illegally obtaining good  $x$  (resources expended to circumvent technology, etc.)

In fact,  $C(x)$  has actually been increasing over time,<sup>83</sup> while  $V(x)$  has been decreasing due to technological advancements.<sup>84</sup> As noted before, this widening gap has contributed to the increasing incidence of Internet piracy.<sup>85</sup>

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being prepared for distribution).

<sup>79</sup> This is a significantly simplified version of Becker's representation of "[t]he utility expected from committing an offense." See Becker, *supra* note 3, at 177 n.16 (representing that utility as " $Eu_i = p_i U_i(Y_i - f_i) + (1 - p_i) U_i(Y_i)$ ," with an in-depth examination of the individual terms).

<sup>80</sup> See Becker, *supra* note 3, at 177 ("a rise in the income available in legal activities . . . would reduce the incentive to enter illegal activities and thus would reduce the number of offenses."); POSNER, *supra* note 37, at 242; Stigler, *supra* note 20, at 530.

<sup>81</sup> See, e.g., Becker, *supra* note 3, at 177 (discussing the effect of "a rise in the income available in legal activities," among other factors).

<sup>82</sup> While there are also opportunity costs with regard to other, possibly more lucrative, crimes, the significant opportunity cost is that between illegal and legal activities, since that cost will help determine whether a crime will occur or not.

<sup>83</sup> See, e.g., Claudia H. Deutsch, *Suit Settled Over Pricing Of Music CD's At 3 Chains*, N.Y. TIMES, Oct. 1, 2002, at C1 (discussing artificially high music CD prices from 1995 to 2000 due to industry price-fixing). But see David D. Kirkpatrick, *Music Retailers Slow to Adopt Plan to Lower Price of CD's*, N.Y. TIMES, Oct. 29, 2003, at C1 (discussing Universal Music's plans to reduce retail prices of music CDs and the slow application of those price cuts by retailers).

<sup>84</sup> See Tomlinson, *supra* note 1, at 3 (noting that technological advances such as high-speed Internet connections and media encoding technologies have enabled more efficient piracy).

<sup>85</sup> See Steve Lohr, *Fighting the Idea That All the Internet Is Free*, N.Y. TIMES, Sept. 9,

To reduce the gains from crime (G), copyright holders and lawmakers should attempt both to reduce the selling price and to raise the costs of illegally obtaining copyrighted works.<sup>86</sup> Copyright owners have worked to decrease G by reducing the retail price of new music CDs,<sup>87</sup> lobbying Congress to increase legal protections of copyrighted goods,<sup>88</sup> implementing technological protections to make piracy more difficult, and licensing their music to online music vendors such as Apple's iTunes.<sup>89</sup> Technological protections that are easily circumvented will only slightly increase the direct costs of illegally obtaining the copyrighted work,<sup>90</sup> but since purveyors of circumvention mechanisms can now face criminal sanctions for their enabling role in others' infringement, technological protections can still serve an important deterrent purpose.<sup>91</sup>

*C. The Macroeconomic Model*

The basic macroeconomic model of crime (the problem faced by society) can be represented by the following:<sup>92</sup>

$$(3) Z = (O)(H-G) + C(P_1) + P_2C(S)$$

*Such that:*

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2003, at C1 (quoting economist Hal Varian: "The industry has to increase the price of illegal file sharing and make it more attractive to download music legally or purchase CD's. That is the economic gap the industry is trying to close.").

<sup>86</sup> *See id.*

<sup>87</sup> *See* Amy Harmon, *Universal To Cut Prices Of Its CD's*, N.Y. TIMES, Sept. 4, 2003, at C1 (noting Universal Music Group's decision to cut retail prices for music CD's by one third, as part of a strategy to prevent online piracy, because "[m]usic consumers have complained for years that CD prices are too high, and many people who copy music online without paying for it cite high prices as the main reason.").

<sup>88</sup> *See* John Markoff, *Plan Would Use Content, Not Devices, to Fight Piracy*, N.Y. TIMES, Apr. 15, 2003, at C5 (noting that the Digital Millennium Copyright Act was passed "with strong lobbying support from Hollywood and other creators of intellectual property."); *The Criminalization of Copyright Infringement*, *supra* note 5, at 1719.

<sup>89</sup> *See supra* note 27.

<sup>90</sup> *See* Markoff, *supra* note 88.

<sup>91</sup> *See* 17 U.S.C. §§ 1201-1202, 1204 (2000).

<sup>92</sup> This model also applies the lessons of Becker's model to copyright infringement, using the elements that are most relevant to the crime of Internet piracy. It seeks to represent the same general factors as Becker's original representation. *See* Becker, *supra* note 3, at 180-85 (discussing in detail the parameters of the expanded model); Klevorick, *supra* note 4, at 292 ("In his 1968 article, Becker introduced as the minimand a general social loss function whose arguments were the damages from offenses, the costs of apprehending and convicting offenders, and the social cost of punishments." ) (citations omitted).

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$Z$  = total social harm due to crime

$O$  = Offenses committed at current enforcement level ( $O$  is a function of factors  $P_1$ ,  $S$ , and  $G$  for each crime, as described above)

$H$  = harm to society caused by crime's commission (per offense)

$G$  = expected gain to the perpetrator from the crime (per offense)

$P_1$  = perceived probability of conviction for each crime

$C(P_1)$  = cost of enforcement measures to effect  $P_1$

$P_2$  = actual probability of conviction for each crime

$C(S)$  = cost of administering punishment  $S$  when perpetrator is convicted<sup>93</sup>

At first glance, the above model appears to contain elements for only one potential perpetrator; it does not consider multiple offenders or the fact that different perpetrators may hold different values for each element.<sup>94</sup> Not all potential perpetrators will necessarily perceive the same probability of apprehension and conviction ( $P_1$ ), and the harm ( $H$ ) and gains ( $G$ ) from each crime of the same type may differ from crime to crime.<sup>95</sup> In addition, the sentence if convicted ( $S$ ) and the actual probability of conviction ( $P_2$ ) vary from perpetrator to perpetrator based on different criminal records and their legal resources, respectively.<sup>96</sup> The above terms therefore represent average values for the entire population.

*Total Social Harm Due to Crime: Z*

The goal of the macroeconomic model is to minimize  $Z$ , the total societal disutility due to crime. This includes costs such as the harms from crime and the costs of preventing and prosecuting that crime.<sup>97</sup> While a complete dearth of crime would be preferred, the costs of preventing all crimes (if actually possible) would be so large that they would ostensibly outweigh the benefits of having no crime.<sup>98</sup> Thus, there is actually an "optimal" level of crime – and a

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<sup>93</sup> See Becker, *supra* note 3, at 174-76 (discussing the costs of both apprehension and conviction).

<sup>94</sup> See *id.* at 178.

<sup>95</sup> See *id.*

<sup>96</sup> See *id.*

<sup>97</sup> See COOTER & ULEN, *supra* note 39, at 443. This model should also consider the costs to society from error costs in judgments, particularly false positives (false convictions), but for simplicity this model will exclude that cost. See Coleman, *supra* note 49, at 314-15 ("[As] the 'price' of an offence increases, the social cost of a mistake in judgment increases. It is one thing to impose a \$5 fine mistakenly, another to impose a life sentence.").

<sup>98</sup> See Becker, *supra* note 3, at 180-81 (arguing that achieving an arbitrarily low rate of

corresponding level of law enforcement - that will best minimize both the costs of crime and the costs of preventing it.<sup>99</sup>

Theoretically, the most precise method of utilizing the macroeconomic model would be to find, through thorough empirical research, values for each of the elements, and then to determine which combination of the elements actually minimizes Z. In reality, however, it likely would be impossible to ascertain actual numerical representations for each element, no matter how much empirical research is conducted. Consequently, like most economic models, this model is not intended to be used to arrive at an actual numerical answer. Instead, the model as a whole, and the elements therein, should simply be used to understand how each factor affects the criminal justice system, and how small changes in the law or policy affect the overall system.

*Offenses Committed at Current Enforcement Level: O*

O, the number of offenses committed, is dependent on the microeconomic model of crime, and thus is properly represented as  $O(P_1, S, G)$ .<sup>100</sup> As noted above, this element represents the average number of offenses on a population-wide level.

*Harm to Society Caused by Crime's Commission: H*

The most intuitive aspect of this model is H, the harm to society caused by a crime's commission (per offense).<sup>101</sup> This includes not only direct costs to the victim but also indirect costs incurred by others: for example, when a larceny occurs, the total harm to society includes not only the loss of the stolen goods to the victim but also indirect costs incurred by others who learn of the crime and take costly precautions to prevent future similar crime.<sup>102</sup> The primary harms of Internet piracy are lost revenue to the copyright owners and lost jobs as a result of this lost revenue.<sup>103</sup>

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crime would be prohibitively expensive); Posner, *supra* note 37, at n.25; Stigler, *supra* note 20, at 526-27. Furthermore, there is a certain amount of socially desirable "crime" (i.e. considering necessity or duress theories), so there is a social benefit for those crimes.

<sup>99</sup> See Stigler, *supra* note 20, at 526-27 (concluding that, based on diminishing returns to investment in crime prevention, there is likely an optimal level of crime which minimizes all costs involved).

<sup>100</sup> See *supra* Part III.B.

<sup>101</sup> See Becker, *supra* note 3, at 172-74.

<sup>102</sup> See *id.* at 200-01 (discussing private expenditures on crime prevention); COOTER & ULEN, *supra* note 39, at 452-53 (discussing private deterrence measures such as burglar alarms and fences).

<sup>103</sup> See Mousley, *supra* note 5, at 671-72 (reporting that losses from piracy in the United States ranges from \$8.31 billion in revenue from software piracy to \$4.2 billion from piracy of musical works).

*Expected Gain to the Perpetrator from the Crime: G*

One controversial element of this model is G: the expected gain to the perpetrator (per offense).<sup>104</sup> There has been substantial debate among scholars regarding this factor's inclusion in the total social cost of crime, particularly when considering violent crimes.<sup>105</sup> Some commentators argue that it is unacceptably amoral to consider the utility violent criminals like rapists or murderers gain from their crime when calculating total social loss.<sup>106</sup> In a violent crime, utility to the perpetrator is not a transfer of utility from the victim. For economic crimes such as larceny, however, an actual transfer has occurred as the core of the crime, and potential violence exists only as a means of facilitating that transfer.<sup>107</sup>

For example, if an individual downloads an infringing copy of a copyrighted work, which he values at \$10, and the purchase of a licensed copy would have cost \$18, it would overstate the total social loss to conclude that the crime caused a net loss to society of \$18. In this example, the perpetrator's utility gained by the good (\$10) has been appropriated by, or transferred to, the perpetrator.<sup>108</sup> However, the \$8 difference between the perpetrator's utility for the work and the copyright holder's selling price would not exist in the absence of this crime because, based on the discrepancy assumed above, the perpetrator would never have purchased the work.<sup>109</sup>

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<sup>104</sup> See Becker, *supra* note 3, at 177 n.16.

<sup>105</sup> See COOTER & ULEN, *supra* note 39, at 444; Barnes, *supra* note 4 at 638-39 (discussing the nontransferability of utility in violent crimes and the problem of considering noneconomic utility gained by the perpetrator).

<sup>106</sup> See Stigler, *supra* note 20, at 527 (criticizing Becker's assignment of social value to gains from the crime, arguing "what evidence is there that society sets a positive value upon the utility derived from a murder, rape, or arson? In fact the society has branded the utility derived from such activities as illicit.").

<sup>107</sup> See POSNER, *supra* note 37, at 224-27 (discussing in the intentional tort context the coerced transfer of wealth and the corresponding costs to each individual and society).

<sup>108</sup> See Posner, *supra* note 37, at 1201-04 (suggesting that at least some criminals choose to steal because they value the stolen good at below the market price).

<sup>109</sup> This observation suggests that in cases where the perpetrator truly values a copyrighted work at a lower price than that good is offered for sale, simply obtaining an illegal copy of that work is in fact a pareto-improving transaction: the copyright holder is no worse off (in absence of the illegal transaction, the perpetrator would not have purchased a legal copy anyway), and the perpetrator is better off (now he owns a copy, albeit an infringing copy, of a work, that ostensibly brings the perpetrator substantial utility). See EDGAR K. BROWNING & MARK A. ZUPAN, MICROECONOMIC THEORY & APPLICATIONS 500 (6th ed. 1999) ("An allocation of resources is inefficient when it is possible, through some feasible change in the allocation of resources, to benefit at least one person without making any other person worse off.").

*Cost of Enforcement Measures to Effect  $P_1$ :  $C(P_1)$*

A law enforcement agency must expend significant resources to affect the potential perpetrator's perception of the probability he will be apprehended and convicted ( $P_1$ ).<sup>110</sup> While the earlier section concerning  $P_1$  discussed the effect of  $P_1$  on perpetrators,<sup>111</sup> this factor represents the costs of manipulating  $P_1$  from the perspective of the social planner. In traditional law enforcement terms, increasing  $P_1$  translates into more prominent police presence, more effective law enforcement techniques, and more highly skilled prosecutors.<sup>112</sup> For Internet piracy, copyright owners themselves absorb much of this cost when they monitor the Internet for traces of their property being illegally distributed.<sup>113</sup> Nevertheless, the ability of Internet pirates to disguise their "location" can make these costs significant.<sup>114</sup>

*Actual Probability of Conviction for Each Crime:  $P_2$*

$P_2$  represents the actual probability that a perpetrator will be convicted. This value does not serve a deterrence function directly, so it does not affect the number of crimes committed, only the proportion of crimes punished.<sup>115</sup> Because punishment is only administered if the perpetrator is apprehended and convicted, the cost of administering  $S$  is discounted by  $P_2$ , as reflected by the last term of the macroeconomic model above.

As noted above, because it is infeasible for  $P_2$  to be close to 1, lawmakers must make a policy decision in setting a proper level of enforcement. They should choose this level based on the underlying goal of the macroeconomic model: to minimize  $Z$ , the total cost to society from both crime and efforts to prevent crime.<sup>116</sup> To establish a tangible value for the target enforcement level, it would be necessary to collect and analyze data regarding the actual harms from a given crime,  $H$ ,<sup>117</sup> and the costs of enforcement,  $C(P_1)$ . An empirical analysis is not the goal of this Note, so actual calculations will be not be done. However, an excellent example of this choice of enforcement level is the RIAA's decision to file lawsuits against only those individuals sharing

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<sup>110</sup> See Becker, *supra* note 3, at 174-76 (discussing the costs of both apprehension and conviction).

<sup>111</sup> See *supra* Part III.B.

<sup>112</sup> See Posner, *supra* note 37, at 1206-07.

<sup>113</sup> See *The Criminalization of Copyright Infringement*, *supra* note 5, at 1720-21.

<sup>114</sup> See, e.g., Heingartner, *supra* note 11 (discussing the time-consuming efforts of prosecutors as they attempt to locate Internet pirates: "as some pirates find better ways to mask their identities, it is becoming harder to track them. 'They're truly ghosts on the Internet now,' Mr. Plante of Symantec said. 'They're virtually untraceable.'").

<sup>115</sup> See *supra* discussion of  $P_1$  in Part III.B.

<sup>116</sup> See *supra* note 97.

<sup>117</sup> See Mousley, *supra* note 5, at 671-72, for estimates.

large numbers of files, and not to track down every single infringer.<sup>118</sup>

*Cost of Administering Punishment S When Perpetrator is Convicted: C(S)*

C(S) represents the cost of applying punishment S in the event of conviction. This cost can vary widely depending on punishment, but may include administrative costs, housing costs of prison inmates, and enforcement costs of collecting fines.<sup>119</sup> Because convictions occur with probability  $P_2$ , these costs are not actually incurred for all crimes committed.

When the sentence is incarceration, costs are the highest, including housing costs for the duration of the incarceration, employment costs of prison personnel, and other infrastructure costs.<sup>120</sup> When the sentence is probation, the costs to society are lower, because then only probation officers' salaries are required.<sup>121</sup> When the sentence is a fine, societal costs are the lowest because there is essentially a direct transfer of wealth from the perpetrator to society or to the victim.<sup>122</sup> In addition, fines may be assessed so the victim is no worse off than before the crime, restoring loss from the crime completely.<sup>123</sup> In general, the only real societal costs of fines are the administrative costs of enforcing the judgment.

It is important to note that because the cost of increasing C(S) is much less than the cost of increasing  $P_1$  or  $P_2$ , the most cost-effective punishment scheme under this model is one with a high penalty and a low probability of apprehension.<sup>124</sup> Most current criminal copyright statutes tend to follow this scheme.<sup>125</sup> However, a conclusion that this scheme is optimal is subject to factors outside the above underlying model, explained in Section V.

As noted in the beginning of this section, the above elements should not be

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<sup>118</sup> See *supra* note 61 (mentioning that the RIAA has primarily sought to prosecute the most egregious offenders).

<sup>119</sup> See Becker, *supra* note 3, at 193.

<sup>120</sup> See *id.*; Dau-Schmidt, *supra* note 4, at 30-31; COOTER & ULEN, *supra* note 39, at 468 (noting that the average maximum security prisoner costs \$20,000 to \$30,000 per year to be incarcerated).

<sup>121</sup> See Becker, *supra* note 3, at 193 (discussing the costs associated with probation as punishment).

<sup>122</sup> See *id.* at 190-98 (discussing the superior efficiency of fines as punishment); POSNER, *supra* note 37, at 246 (stating, "From an economic standpoint, the use of fines should be encouraged"); COOTER & ULEN, *supra* note 39, at 448-49.

<sup>123</sup> See Becker, *supra* note 3, at 194 (discussing the optimal fine as restorative from the victim's perspective and also commenting on the implications of this theory on the distinctions between criminal law and tort law).

<sup>124</sup> See Posner, *supra* note 37, at 1206-07.

<sup>125</sup> See *supra* Part III.B (discussion of S). The NET act and the DMCA have very high penalties compared to the value of the infringing goods required for those penalties, and the likelihood that any given infringer will be identified and prosecuted is relatively low.

considered as having actual discrete values. Instead, what is important is the interaction between law, policy decisions and the above-described factors, and ultimately, the effect on the overall model, *Z*. Any change in law that based on economic theory is likely to reduce *Z* is thus desirable.

#### IV. CRITICISM OF THE ECONOMIC MODEL

##### A. *Rationality*

Most critics of the economic models of crime focus on the microeconomic model's inability to accurately reflect the behavior of individual criminals, particularly when applied to violent crimes.<sup>126</sup> Other critics condemn its assumption of rational, cost-benefit analyzing actors because it eliminates all considerations of *mens rea*, which is vitally important in most criminal statutes and to some commentators' notions of "justice."<sup>127</sup> Economists who have commented on the model's applicability to distinct categories of crime<sup>128</sup> have criticized the application of the economic model to "property crimes" generally, primarily because property-based crimes have high recidivism rates.<sup>129</sup> Notwithstanding, there is "a growing empirical literature" reflecting on criminals' ability for rational responses to changes in the costs and benefits of crime, so the abovementioned criticism may be lacking empirical support.<sup>130</sup>

Even if the economic models fail to reflect the actual behavior relating to "impulsive" or "irrational" crimes, predominantly "economic-based" crimes are less susceptible to the model's shortcomings.<sup>131</sup> Gains from economic-

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<sup>126</sup> See Becker, *supra* note 3, at 189-90 (commenting on the applicability of deterrence theory for different categories of crimes); Kahan, *Between Economics and Sociology*, *supra* note 4, at 2477 (criticizing the use of economic theory for deterrence of certain violent crimes or crimes where perpetrators are likely to be acting irrationally).

<sup>127</sup> See Schulhofer, *supra* note 33, at 339.

<sup>128</sup> See, e.g., Barnes, *supra* note 4, at 646-50 (dividing crime into two categories: *Malum Prohibitum*, consisting of "Social Torts" and "Paternalistic Crimes," and *Malum In Se*, consisting of "Property Crimes," "Crimes Against the Person," and "Inchoate Crimes."); Becker, *supra* note 3, at 170-72 (discussing different categories of crimes: "crimes against persons," "crimes against property," "illegal goods and services," and "some other crimes").

<sup>129</sup> See Barnes, *supra* note 4, at 648 (criticizing Becker's model in particular, referring primarily to property crimes such as arson, burglary, and unarmed robbery, and claiming that the generally higher recidivism rates for property crimes and the traditional goals of incapacitation and revenge when punishing property crimes make the economic model less applicable).

<sup>130</sup> See HERBERT L. PACKER, *THE LIMITS OF THE CRIMINAL SANCTION* 41-42 (1968) (asserting that the rational-actor deterrence model can be useful in analyzing "irrational" or "impulsive" crimes); POSNER, *supra* note 37, at 243; Posner, *supra* note 37, at n.25 (citing D. PYLE, *THE ECONOMICS OF CRIME AND LAW ENFORCEMENT* (1983)).

<sup>131</sup> See Barnes, *supra* note 4 at 644-45; Katyal, *supra* note 4, at 2393.

based crime are monetary, which indicates a more rational approach to the crime than for violent crimes. Therefore, whether committed for personal or commercial gain, a crime like copyright infringement might be more accurately represented in an economic model than other crimes.<sup>132</sup>

### B. Information Access

One argument against the rational actor model is that many Internet “pirates” may simply not be aware of the potential penalties for their actions, maybe because of a lack of maturity<sup>133</sup> or perceptions concerning the anonymity of the Internet.<sup>134</sup> Well-publicized subpoenas and lawsuits by the RIAA have undoubtedly helped alert the public about the seriousness of, and penalties for, copyright infringement. Similarly, there are consumer education programs striving to further this awareness.<sup>135</sup> However, as long as a potential

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<sup>132</sup> Crimes committed solely for financial gain are more rationally approached because there is a tangible and definable expected gain from the crime. This value can be weighed against the costs incurred by committing that crime to determine if the crime would be on the whole “profitable.” See, e.g. Barnes, *supra* note 4, at 640-41 (“[T]he assumption of rationality, even as defined by economists, seems most problematic when an element of the crime itself is some kind of irrationality—for example, second degree murder and manslaughter. The common law for these crimes requires that the offender have acted in the heat of passion, before reason has had time to reassert itself. These offenders would have to be, by definition, “irrational actors”—for if one weighs the costs and benefits of committing murder and then does in fact commit the murder, the offender has committed first degree murder, not second degree murder or manslaughter. Like the assumption of deterrence, the “rational actor” assumption makes it difficult for law and economics scholars to produce sound theories about the criminal law.”) (citations omitted); Steven Shavell, *Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent*, 85 COLUM. L. REV. 1232, 1242-43 (1985) (arguing that some crimes are not deterrable because individuals may act irrationally, namely in crimes committed during a fit of “uncontrollable rage”). Since profit-based nonviolent crimes are the category of crime least similar to those committed “during a fit of uncontrollable rage,” it is reasonable to infer that the rationality assumption is most accurate in those crimes.

<sup>133</sup> See Madden & Lenhart, *supra* note 56, at 6 (noting that a large proportion of individuals who disseminate pirated copies of copyrighted works are aged 18 to 29, or are full time students, or both).

<sup>134</sup> See Barnes, *supra* note 4, at 631; Katyal, *supra* note 4, at 2447. See also Tomlinson, *supra* note 1, at 3-4 (discussing “softlifting,” software piracy that occurs in the home and that consumers may believe is “perfectly legal”).

<sup>135</sup> Copyright owners such as the MPAA and the RIAA have pushed for a variety of methods for educating the public about intellectual property rights. See Madden & Lenhart, *supra* note 56, at 3; Mousley, *supra* note 5, at 667 (mentioning legal, social, and market approaches to the Internet piracy problem); Laura M. Holson, *Studios Fight Piracy With Education*, N.Y. TIMES, Dec. 29, 2003, at C6; RespectCopyrights.org, available at <http://www.respectcopyrights.org> (last visited Apr. 28, 2005) (noting that the Motion Picture

perpetrator is aware that severe penalties exist for a certain behavior, his ignorance of exact provisions does not preclude effective deterrence.<sup>136</sup> In the early years of the first version of Napster (approximately 1998-2002), the average Internet user likely was not fully aware that downloading music off the Internet could be a criminal offense.<sup>137</sup> However, the increased attention given to Internet piracy by the media since 2002 makes it unlikely that lack of information is a still significant impediment to a deterrence-based economic model today.<sup>138</sup>

### C. *Risk Neutrality*

As noted in Section III.A, the microeconomic model assumes that if an individual is risk neutral,<sup>139</sup> he will commit a crime if  $P_1S < G$  for a given crime. Individuals who are risk averse<sup>140</sup> or risk preferring,<sup>141</sup> on the other hand, will not react to the incentives and disincentives in exactly the same way.<sup>142</sup> Risk averse offenders essentially attach greater disutility to a small probability of conviction than those who are risk neutral – effectively

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Association of America, Inc. (MPAA) hopes to raise awareness about the impact of digital piracy on the copyright industries).

<sup>136</sup> See Katyal, *supra* note 4, at 2448 (discussing how the stigma, or “social price,” of criminal penalties can deter crimes even if the “monetary price” is unknown). Of course, in most college-age communities, there is no such stigma attached to Internet piracy. See Dr. Silke von Lewinski, *Symposium: Fifth Annual Conference On International Intellectual Property Law And Policy: Essay: Copyright In Central And Eastern Europe: An Intellectual Property Metamorphosis*, 8 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 39, 59 (1997).

<sup>137</sup> See, e.g., Lewinski, *supra* note 136, at 59.

<sup>138</sup> The issue of information access is probably much less significant today as a result of the intensive attention the topic has been given by the media since 2002 (for example, there have been nearly four times as many articles in the New York Times about Internet piracy, and prosecution of pirates, from 2002 to 2004 as there were from any two-year period before 2002), public service announcements by industry groups, and other education attempts.

<sup>139</sup> Risk neutral individuals are always indifferent between two outcomes that have the same expected value (for example, a 100% chance of receiving \$100 and a 10% chance of receiving \$1000). See POSNER, *supra* note 37, at 12-13.

<sup>140</sup> Risk averse individuals always prefer, between two choices with the same expected value, the choice with the least risk (for example, they would prefer a 100% chance of receiving \$100 over a 10% chance of receiving \$1000). See POSNER, *supra* note 37, at 12-13.

<sup>141</sup> Individuals who are risk preferring always prefer, between two choices with the same expected value, the choice with the maximum potential return (for example, they would prefer a 10% chance of receiving \$1000 over a 100% chance of receiving \$100). See POSNER, *supra* note 37, at 12-13.

<sup>142</sup> See Becker, *supra* note 3, at 183-85; Posner, *supra* note 37, at 1208.

overestimating the actual risk of conviction.<sup>143</sup> Those who are risk preferring, on the other hand, will attach a lower disutility to a small probability of conviction – effectively underestimating that risk.<sup>144</sup> If most offenders are risk averse, optimal law enforcement would therefore choose a  $P_1$  arbitrarily close to zero, while increasing  $S$  proportionately.<sup>145</sup> On the other hand, if offenders are risk preferring, optimal law enforcement would choose “positive and finite values “ of both  $P_1$  and  $S$ .<sup>146</sup> It is worthwhile to note that there is significant evidence that criminal offenders tend to be risk preferring.<sup>147</sup>

Based on the corresponding costs necessary to increase either  $P_1$  or  $S$ , an efficient use of law enforcement resources would require, when possible, a reduction in  $P_1$  with a “compensated” increase in  $S$ .<sup>148</sup> However, unless lawmakers have evidence of the average risk-preference of the target population – those individuals most likely to commit a given crime – setting actual penalties in exactly the manner described above may not be optimal. Empirically, individuals generally tend to be risk averse<sup>149</sup> although certain populations, such as college-age youth, may be risk preferring.<sup>150</sup> Research concerning individuals who admit to downloading infringing works tends to reflect a wide demographic range among perpetrators.<sup>151</sup> However, many of

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<sup>143</sup> See Becker, *supra* note 3, at 183-85.

<sup>144</sup> See *id.*

<sup>145</sup> See *id.*

<sup>146</sup> See *id.* at 184.

<sup>147</sup> See *id.* at 178.

<sup>148</sup> See Becker, *supra* note 3, at 184.

<sup>149</sup> See, e.g., Diane Klein, First Annual Academic Convocation: *Distorted Reasoning: Gender, Risk-Aversion And Negligence Law*, 30 SUFFOLK U. L. REV. 629, *passim* (1997); Russell Korobkin, Symposium: *Determining Health Care Rights From Behind a Veil of Ignorance*, 1998 U. ILL. L. REV. 801, 808, 810-12 (1998) (citing the importance of recognizing “human beings’ natural risk aversion”).

<sup>150</sup> The traditional belief is that youth do not believe they will be caught, i.e., the “it won’t happen to me” phenomenon. *But see* Michael K. Block & Vernon E. Gerety, Article: *Some Experimental Evidence on Differences Between Student and Prisoner Reactions to Monetary Penalties and Risk*, 24 J. LEGAL STUD. 123, n.3 (Jan. 1995) (citing James C. Cox, B. Robertson, & Vernon L. Smith, *Theory and Behavior of Single Object Auctions*, 2 Research in Experimental Economics (Vernon L. Smith ed. 1982); R. Mark Isaac & James M. Walker, *Information and Conspiracy in Sealed Bid Auctions*, 6 J. ECON. BEHAV. & ORG. 139 (1985)) (“For college students, there exists a substantial amount of experimental literature which supports the hypothesis that they behave as if they are risk averse.”). On the other hand, surveys indicate that students are less likely to care about copyright laws. See Madden & Lenhart, *supra* note 56, at 5-6. In addition, “[s]tudents are more likely to share files than non-students. More than a third (35%) of fulltime students and 28% of part-time students share files, while 18% of non-students report the same behavior.” *Id.*

<sup>151</sup> See Madden & Lenhart, *supra* note 56, at 5 (displaying, by gender, race, age, income, education, and Internet experience, the percentage of surveyed Internet users that download

these individuals are roughly college-age,<sup>152</sup> probably as a result of that population's relative technological savvy and/or greater access to cheap or free high-speed Internet access.<sup>153</sup> Therefore, a rough survey of available data would imply that on average, potential Internet pirates are probably slightly risk preferring and, therefore, an optimal law enforcement scheme should favor a higher probability, lower sanction scheme.

For the reasons already stated, the above-mentioned common criticism of the economic model of crime will probably not significantly reduce the model's reliability. Rationality is less of an issue for profit-driven crimes such as Internet piracy. Both copyright owners and the government are already making an extensive effort to address the information access issue. Finally, empirical conclusions and insights on how the entire population approaches risk and punishment, included in the following section, can help determine the optimal combination of probability and severity of punishment to correspond to potential perpetrators' risk preferences.

## V. BEHAVIORAL ECONOMICS ISSUES

Behavioral economics incorporates theories from psychology and sociology into the rationality assumption of classical economics to better understand how individuals make decisions and to determine when the rationality assumption is more or less accurate.<sup>154</sup> For example, potential offenders may act in what classical economists would call an "irrational" manner in response to probability of apprehension and severity of punishment.<sup>155</sup> A behavioral economist would understand that these responses could be in fact rational, and that the interrelations between the relevant factors are more complex than a classical economist would assume.<sup>156</sup>

### A. *Probabilities*

Sometimes, individuals discount very low probabilities until they are assumed to be arbitrarily close to zero.<sup>157</sup> For example, regardless of the severity of punishment, if individuals perceive that certain criminal behavior is widespread they may infer an "environment of permissiveness" with regard to

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music).

<sup>152</sup> See *id.* (noting that recent surveys report that over 50% of Internet users who download music are age 18-29).

<sup>153</sup> See *id.* at 7 (reporting that "broadband users are much more likely to share files online than dial-up users – 30% of Internet users with a broadband connection at home share files compared to 19% of dial-up users").

<sup>154</sup> See Katyal, *supra* note 4, at 2387.

<sup>155</sup> See *id.*

<sup>156</sup> See *id.*

<sup>157</sup> See *id.* at 2411; Posner, *supra* note 37, at 1208.

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that behavior and thus be more likely to engage in it themselves.<sup>158</sup> Thus, if a law relies on a “high sanction, low probability” scheme to reduce overall costs of enforcement, this countervailing “social influence” effect could potentially offset efficiency gained by that scheme.<sup>159</sup> The effect of such societal influences on each individual tends to distort decisionmaking away from a purely individualistic microeconomic model, towards more collectively defined models of behavior.<sup>160</sup> This is the sort of situation where a classical economist would be unable to explain the individual’s decision in isolation, and thus his assumptions would be less accurate.<sup>161</sup>

*B. Sanctions*

Individuals’ perceptions of criminal sanctions tend somewhat to rely on their perception of “others’ behavior and attitudes toward the law” when forming guidelines for their own behavior.<sup>162</sup> Informal sanctions such as peer disapproval can sometimes be more effective than sanctions established by law, and societal attitudes that impose social costs on certain behavior can help reinforce the deterrent effect of existing criminal sanctions.<sup>163</sup> Similarly, unpopular or excessively aggressive laws, such as zero-tolerance policies or excessive sanctions, may unintentionally encourage defiance of those laws and even result in selective enforcement.<sup>164</sup> Consequently, an arrangement of low probability, and high severity, of punishment, could lead to less deterrence.<sup>165</sup>

One solution might be to create laws or policies that not only impose

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<sup>158</sup> See Kahan, *Between Economics and Sociology*, *supra* note 4, at 2487; Kahan, *Social Influence*, *supra* note 4, at 350.

<sup>159</sup> See Kahan, *Social Influence*, *supra* note 4, 351-52.

<sup>160</sup> See *id.* at 356-57.

<sup>161</sup> See Katyal, *supra* note 4, at 2387 (noting that the classical economic model is “thin” without enhancements from behavioral economics or other disciplines).

<sup>162</sup> See Kahan, *Social Influence*, *supra* note 4, at 354-55 (citing empirical studies and the link between an individual’s obedience of the law and perception of others’ obedience of that law).

<sup>163</sup> See *id.* at 355.

<sup>164</sup> See *id.* at 363-64 (citing as an example, “[p]olicies that aim at suppressing possession usually fail; indeed, when authorities aggressively seek out and punish students who possess weapons, their behavior reinforces the message of defiance associated with guns, thereby increasing their expressive value”) (citations omitted).

<sup>165</sup> See Katyal, *supra* note 4, at 2450-51 (“Ever since Becker, a standard law and economics assumption has been that reducing enforcement costs and increasing penalties creates optimal deterrence. But this approach ignores the way in which people react to high penalties. Such penalties create what may be termed an inverse sentencing effect. High penalties, instead of increasing conviction rates, may decrease them. As penalties increase, people may not be as willing to enforce them because of the disproportionate impact on those caught.”) (citations omitted).

criminal sanctions but also influence social norms to coincide with legal proscriptions.<sup>166</sup> Such policies aim at transforming our societal view of intellectual property rights until social attitudes on intellectual property theft are much more closely aligned with attitudes on real property and personalty theft.<sup>167</sup> To help restructure social norms related to Internet piracy, copyright owners have implemented strategies such as the MPAA's anti-piracy public service announcements<sup>168</sup> and other education-based approaches, particularly for younger consumers who are much more familiar with technology than with the purposes of intellectual property.<sup>169</sup>

On the other hand, many individuals acquire a majority of their knowledge about the risks and gains of crime from their peers, so it may be difficult to modify social norms within certain social groups.<sup>170</sup> Changing social behavioral norms can also be difficult either because there may be a significant "lag" between instigating and achieving this type of change<sup>171</sup> or because attempts at values "re-education" are often dismissed as mere propaganda, particularly by consumers with already little respect for intellectual property rights.<sup>172</sup> Consequently, copyright owners should not expect rapid changes in the public's respect for intellectual property rights and should take care not to alienate the very segments of the population that are least likely to be responsive to such campaigns.<sup>173</sup> For example, when the band Metallica started suing its own fans for Internet piracy in 2000, there was severe public backlash.<sup>174</sup> Particularly when the targeted group is among those most likely to be distrustful of copyright owners, namely teenagers and young adults, this

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<sup>166</sup> See Kahan, *Social Influence*, *supra* note 4, at 365.

<sup>167</sup> See Mousley, *supra* note 5, at 686. See also A. O. Scott, *These Are Your Movies On Piracy*, N.Y. TIMES, Nov. 16, 2003, at AR15 (discussing the motives behind the MPAA's respectcopyrights.org campaign).

<sup>168</sup> See Scott, *supra* 167.

<sup>169</sup> See sources cited *supra* note 135.

<sup>170</sup> See Kahan, *Social Influence*, *supra* note 4, at 378-79.

<sup>171</sup> See Katyal, *supra* note 4, at 2451-53.

<sup>172</sup> See Mousley, *supra* note 5, at 686.

<sup>173</sup> See, e.g., John Schwartz, *In Survey, Fewer Are Sharing Files (Or Admitting It)*, N.Y. TIMES, Jan. 5, 2004, at C1 (mentioning RealNetworks CEO Rob Glaser's comments that attitudes towards copyright laws of "core Internet users, like college students, have not changed much . . . . 'The mind-set on college campuses is still, Whatever'").

<sup>174</sup> See, e.g., Matt Richtel & Neil Strauss, *Metallica to Try to Prevent Fans From Downloading Recordings*, N.Y. TIMES, May 3, 2000, at C1 (noting the severe backlash against Metallica by its fans over Metallica's suits against Napster and individual fans trafficking in Metallica songs); Neil Strauss, *File-Sharing Battle Leaves Musicians Caught in Middle*, N.Y. TIMES, Sept. 14, 2003, at N1 (noting the difficult situation that artists face when their music labels sue their fans, especially considering the fact that "few musicians ever actually receive royalties from their record sales on major labels.").

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type of adversarial approach is likely to hinder any attempts to restructure social norms on intellectual property rights.<sup>175</sup>

The theories in this section may contradict the classical economic model's assumptions. However, if one assumes that behavioral economics enhances, rather than contradicts, other economic concepts, the above points can be used to augment an understanding of the interaction between law and human behavior. This section should be considered as a series of important caveats to the classical economic model to avoid perverse results from and guide the formulation of certain law or policy decisions. The above examples serve to illustrate how copyright owners have engaged in many different strategies to achieve their goals with both effective and detrimental results.

## VI. CONCLUSIONS

Based on the above analysis, it should be clear that some of the solutions attempted by copyright holders are likely to be successful, but others less so. Copyright owners have been diligent in finding ways to reduce the gains from crime, increase penalties, and optimally enforce violations. Statutes tend to observe theories of general deterrence and marginal deterrence, and tend to rely on fines and imprisonment for punishment. Copyright owners have been working to increase information access with regard to which acts are criminal and the potential consequences of those acts, and have attempted to reshape social norms by promoting the value of copyright laws in various educational strategies.

However, the average individual's low risk of actually being prosecuted for Internet piracy, coupled with very high statutory penalties that are rarely implemented, does not appear to be an effective method of deterrence. Technological protections on copyrighted works ostensibly could reduce gains from crime, but most are easily circumvented. The DMCA was an excellent step towards preventing such circumvention, however, and will prove a valuable tool in future efforts to protect technological protections of copyrighted works.

What should copyright owners and lawmakers take away from this Note? First, they should realize the importance of reducing the gains from crime, and that their efforts thus far are moving in the right direction. Second, copyright owners and lawmakers should understand that the relationship between the severity of potential punishment and likelihood of conviction is not only complex but also vital to effective deterrence and optimal criminal law. Consequently, they need to carefully examine the demographics of potential Internet pirates in an attempt to determine their risk preference. Third,

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<sup>175</sup> See Richtel & Strauss, *supra* note 174 ("The impact of lawsuits on fans is a double-edged sword. If you're a record company, do you want record company acts being *persona non grata* at every college campus in America?").

copyright owners and lawmakers should acknowledge the sociological factors that reduce the effectiveness of the “high punishment, low probability” scheme that most criminal copyright statutes tend to implement and try not to rely too heavily on that scheme. Fourth, they should put significant effort into their “intellectual property education” campaigns to effectively reshape social norms with respect to copyright laws, but they must realize that they must be patient as those norms are slowly and gradually affected. Finally, copyright owners and lawmakers should steer clear of campaigns that could alienate those members of the population who are least likely to be responsive to education programs, such as young adults.

Copyright owners and lawmakers should consider the teachings of economics when enacting statutes and policies aimed at preventing crime. Continuing technological advances have threatened the viability of traditional copyright laws. To limit the many harms of Internet piracy, new ways of approaching the problem should be explored. The economic model of crime is a promising area from which to draw policy suggestions and observations about the behavior of potential criminals, and the weaknesses of that model are least troublesome when applied to a nonviolent profit-driven crime such as Internet piracy. The observations and conclusions from this Note are valuable when evaluating existing anti-piracy policies and potential future policy changes.