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PLATFORM LIABILITY IN COPYRIGHT ENFORCEMENT

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Every year, millions of dollars are invested and spent on works covered by copyright. However, in the platform economy, where most content is currently stored and viewed, copyright holders face infringements of their rights at an ever-increasing scale. While Section 230 of the Communications Decency Act serves a useful speech-protecting function, unless the United States is willing to forego copyright law and the economic interests that it protects, some effort is needed to develop an efficient mechanism of copyright enforcement for platforms. In this paper, we pull together copyright law, the law of platform liability, and the economics of enforcement to explore models of no liability, notice and takedown, strict liability, and negligence. We discuss how platform liability can encourage the creation of creative work, but may also lead to over-blocking and chilling effects. Using a formal model, we consider what mechanisms of copyright enforcement can maintain the speech protections of Section 230 while incentivizing authors to create new works.

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I. INTRODUCTION

The internet has enabled the dissemination of information, knowledge, ideas, and expressions—more generally, content.¹ Content has taken new forms on the internet, most notably as “user-generated content” (e.g., videos, photos and posts). Users created or contribute to this content to share through online platforms.² This kind of content also enjoys copyright protection.

By allowing users to share content, online platforms have made it possible for copyrighted material to be uploaded and distributed at an unprecedented rate. Online platforms generate millions of dollars of ad revenue every year through content produced for internet consumption. For example, platforms like YouTube embed

1. Pierre Berthon et al., *CGIP: Managing Consumer-Generated Intellectual Property*, 57 CAL. MGMT. REV. 43 (2015) (discussing how “user-generated content . . . driven by the internet” ought to be managed).

2. Donald P. Harris, *Time to Reboot: DMCA 2.0*, 47 ARIZ. ST. L.J. 801, 811 (2015).

advertisement before the video is played and on the side or below the video.³

Consumers enjoy numerous benefits from online platforms and their business models. At the same time, the internet has increased the extent of copyright infringement by enabling peer-to-peer sharing systems, allowing video streaming and direct downloads.

At the dawn of the internet, policymakers were faced with the task of balancing the protection of copyrighted works against the protection of online free speech. On the one hand, the US Copyright system was created “[t]o promote the progress of . . . useful arts, by securing for limited times to authors . . . the exclusive right to their respective writings”⁴ The later enacted Copyright Act granted authors a right to exclude that they would enforce by petitioning the courts for injunctions and damages. On the other hand, free speech is protected by the First Amendment: “Congress shall make no law . . . abridging the freedom of speech, or of the press.”⁵ This statement limits how governments can impede the right of expression.

Congress implemented the Communications Decency Act (CDA)⁶ to enable the internet and its associated innovation to flourish. Whether intended or not, Section 230 of the CDA put First Amendment speech protection ahead of copyright protection. Soon thereafter, Congress realized that copyright was suffering from the digital era and passed the Digital Millennium Copyright Act (DMCA)⁷ to reign in some of these problems: “the law must adapt in order to make digital networks safe places to disseminate and exploit copyrighted materials.”⁸ The Act provides copyright holders with injunctive relief for infringing content uploaded on online platforms.⁹

The internet that Section 230 and the DMCA protect today is vastly different from the internet of two decades ago, which consisted

3. See, e.g., Richard Siklos, *A Video Business Model Ready to Move Beyond Beta*, N.Y. TIMES (Sept. 17, 2006) (discussing the early business model of companies online content), <https://www.nytimes.com/2006/09/17/business/yourmoney/17frenzy.html>; Claire Cain Miller, *YouTube Ads Turn Videos Into Revenue*, N.Y. TIMES (Sept. 2, 2010) (discussing how YouTube shares revenues with content creators), <https://www.nytimes.com/2010/09/03/technology/03youtube.html>.

4. U.S. CONST. art. I, § 8, cl. 8 (capitalization omitted).

5. U.S. CONST. amend. I.

6. Communications Decency Act of 1996, Pub. L. 104-104, tit. V, 110 Stat. 133 (codified as amended in scattered sections of 47 U.S.C.), *invalidated in part by Reno v. ACLU*, 521 U.S. 844 (1997).

7. Digital Millennium Copyright Act, Pub. L. 105-304, 112 Stat. 2860 (codified in scattered sections of 17 U.S.C.)

8. S. Rep. No. 105-190, at 2 (1998).

9. 17 U.S.C. § 512; S. Rep. No. 105-190, at 53 (1998) (“Subsection (i)(1)(A) permits the court, under appropriate circumstances, to enter a different form of injunction if the court considers it necessary to prevent or restrain infringement of specific copyrighted material that resides at an identified online location.”).

of nascent internet companies that were encouraged to grow and flourish. Twenty years ago, online service providers had 12 million subscribers.¹⁰ Today's online platforms serve billions of users, making these online service providers among the largest, most powerful companies worldwide. Online platforms provide substantially more benefits to society than the nascent websites of two decades ago but their potential to cause harm is greater as well. This raises the question of whether the safe harbor created for online platforms in Section 230 and in the DMCA is still appropriate today.

In this paper, we compare different liability regimes that online platforms may face for copyright infringing materials that have been posted on their sites. We consider arguments why platforms should be liable for disseminating large amounts of copyrighted material without authorization from right holders and possible drawbacks of liability. From an efficiency perspective, legal liability should generally rest on the party best able to prevent, limit or eliminate harm (the "least cost avoider"). We develop a formal model to assess how different liability regimes incentivize the creation of valuable works without affecting free speech.

We find that online platforms are generally the least cost avoider for copyright infringements in content they host, given that they govern the platform where infringing content is hosted and they can identify or remove infringers and remove the content. Given their information advantage and their ability to remove content or block users, online platforms will usually be better able to stop or prevent infringements than copyright holders.

Imposing liability on online platforms would induce them to internalize the costs of copyright infringements caused by the business model from which they profit. Comparing strict liability with a negligence rule, we need to balance the ability of lawmakers to set the optimal standard of care against the ability of courts to accurately rule on copyright claims. A strict liability rule allows online platforms to determine the optimal level of filtering as well as the value of their business activity, but this could create chilling effects if courts err and the business model of online platforms becomes too costly. A negligence rule can however overcome this problem if the courts can correctly determine when due care has been taken. We consider negligence liability regimes that would be flexible enough to deal with the rapid changes in filtering technology and also correctly determine due care.

Section II discusses the laws and regulations under which platforms operate and shows that, from the CDA to the DMCA, Congress has provided platforms with an affirmative defense against

10. Danielle Keats Citron & Benjamin Wittes, *The Problem Isn't Just Backpage: Revising Section 230 Immunity*, 2 GEO. L. TECH. REV. 453, 463 (2018) (citing *Reno v. ACLU*, 521 U.S. 844, 850–51 (1997)).

liability claims. Section III lays out various arguments in favor of platform liability. Section IV shows how no liability, a notice system, strict liability, and a negligence rule would affect the incentives of online platforms by illustration of a model. Section V proposes a principle-based negligence rule to reconcile the interests of right holders and online platforms with free speech protections.

II. THE CURRENT STATE OF AFFAIRS

While often portrayed as antithetical, Section 230 and copyright law have a common objective: they both strive to foster a content-rich internet. This section discusses Section 230 and other efforts to address liability for copyright infringement on the internet.

A. *Communications Decency Act*

In some jurisdictions, online platforms were held liable for third party posting.¹¹ For example, in *Stratton Oakmont, Inc. v. Prodigy Services Co.*,¹² an online services provider was found liable after it had tried to filter offensive material but failed to remove it all.¹² Lawmakers found it problematic that a platform was penalized for trying but incompletely filtering objectionable material.¹³

As part of a broad campaign to restrict access to sexually-explicit material online,¹⁴ Congress passed the Communications Decency Act (CDA),¹⁵ Title V of the Telecommunications Act of 1996.¹⁶ The aim of the CDA was “to encourage telecommunications and information service providers to deploy new technologies and policies” to block or filter offensive material.¹⁷ In passing the CDA, Congress wanted “to promote the development of e-commerce”¹⁸ and the “vibrant and competitive free market”¹⁹ for computer

11. See William H. Freivogel, *Does the Communications Decency Act Foster Indecency?*, 16 COMM. L. & POL’Y 17, 21 (2011) (discussing pre-CDA cases). In some other jurisdictions, online platforms evaded such liability. For example, in *Cubby, Inc. v. CompuServe Inc.*, 776 F. Supp. 135 (S.D.N.Y. 1991), the court ruled that the Internet service provider was not liable for the defamatory statement made on its website because the intermediary acted as a distributor and not a publisher.

12. *Stratton Oakmont, Inc. v. Prodigy Services Co.*, 1995 WL 323710 (N.Y. Sup. Ct., May 24, 1995), *superseded by statute*, Communications Decency Act of 1996.

13. See Citron & Wittes, *supra* note 10, at 457.

14. S. Rep. NO. 104-23, at 59 (1995).

15. Communications Decency Act of 1996, Pub. L. 104-104, tit. V, 110 Stat. 133 (codified as amended in scattered sections of 47 U.S.C.), invalidated in part by *Reno v. ACLU*, 521 U.S. 844 (1997).

16. *Id.*

17. S. Rep. NO. 104-23, at 59 (1995). See Citron & Wittes, *supra* note 10, at 457.

18. *Batzel v. Smith*, 333 F.3d 1018, 1027 (9th Cir. 2003).

19. *Barnes v. Yahoo!, Inc.*, 570 F.3d 1096, 1099 (9th Cir. 2009).

services. Congress aimed at encouraging the development of the Internet²⁰ without impeding future progress²¹ or freedom of speech or intellectual activity.²² Congress also worried that intervening would impede innovation.²³

Section 230 has become the centerpiece of the CDA.²⁴ The CDA gives (some) immunity to platforms for the content posted by third parties (i.e., content providers).²⁵ The intent behind the safe harbor was that shielding online providers from liability would encourage them to engage in self-regulation. The purpose of Section 230(c)(1) was to protect “Good Samaritan” blocking and screening of offensive material, and to encourage hosting providers to do so.²⁶

20. 47 U.S.C. § 230(a)(1) (2018) (adding that it provides “educational and informational resources to . . . citizens”).

21. *Id.* § 230(a)(2) (adding that filtering technologies “offer users a great degree of control over the information that they receive, as well as the potential for even greater control in the future as technology develops”).

22. *Id.* § 230(a)(3) (adding that the internet provides “a forum for a true diversity of political discourse, unique opportunities for cultural development, and myriad avenues for intellectual activity”).

23. *Id.* § 230(a)(4)–(a)(5) (stating that the internet and associated services “have flourished, to the benefit of all Americans, with a minimum of government regulation”).

24.

(c) Protection for “Good Samaritan” blocking and screening of offensive material

(1) Treatment of publisher or speaker

No provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider.

(2) Civil liability:

No provider or user of an interactive computer service shall be held liable on account of

(A) any action voluntarily taken in good faith to restrict access to or availability of material that the provider or user considers to be obscene, lewd, lascivious, filthy, excessively violent, harassing, or otherwise objectionable, whether or not such material is constitutionally protected; or

(B) any action taken to enable or make available to information content providers or others the technical means to restrict access to material described in paragraph (1).

Id. § 230.

25.

“By its plain language, § 230 creates a federal immunity to any cause of action that would make service providers liable for information originating with a third-party user of the service. Specifically, § 230 precludes courts from entertaining claims that would place a computer service provider in a publisher's role. Thus, lawsuits seeking to hold a service provider liable for its exercise of a publisher's traditional editorial functions — such as deciding whether to publish, withdraw, postpone or alter content — are barred.”

Zeran v. America Online, Inc., 129 F.3d 327, 330 (4th Cir. 1997).

26. Doe v. Internet Brands, Inc., 824 F.3d 846 (9th Cir. 2016).

Congress also worried about disincentivizing users from exercising caution.²⁷

Since passing this amendment, platforms have successfully avoided liability.²⁸ Platforms such as Airbnb, eBay and Amazon have faced numerous civil liability lawsuits and have successfully avoided liability for third-party content.²⁹ At the same time, many such platforms have flourished to the point that Alphabet (Google), Amazon, Apple, and Microsoft have the largest market capitalization in the world.³⁰ Some credit Section 230 with having enabled the growth of these platforms, by freeing platforms from the costs associated with protecting against copyright liability.³¹

At the same time, the tremendous success of online platforms provides an argument for why Section 230 is no longer appropriate today. The platforms that benefit from Section 230 immunity are vastly larger, more powerful and less vulnerable than were the nascent online service providers of two decades ago.³²

Under Section 230, right holders have to monitor any infringement and enforce it against content uploaders and users because intermediaries have no duty to monitor infringements. Much like the copyright system in the analog world where copyright is not self-enforced, the onus is on the copyright holder to monitor infringement and enforce these rights in the digital world.

Online platforms argue that immunity from platform liability is necessary: the DMCA has been crucial for the development of the Internet and has contributed to innovation in technologies and

27. “It is the policy of the United States . . . to remove disincentives for the development and utilization of blocking and filtering technologies that empower parents to restrict their children’s access to objectionable or inappropriate online material.” 47 U.S.C. § 230(b)(4).

28. See, e.g., Chicago Lawyers’ Comm. for Civ. Rights Under Law, Inc. v. Craigslist, Inc., 519 F.3d 666, 669 (7th Cir. 2008) (discussing “whether § 230(c)(1) provides ‘broad immunity from liability for unlawful third-party content,’” and discussing whether a platform should be liable for enabling the violation of the Fair Housing Act).

29. See also *Gentry v. eBay, Inc.*, 99 Cal. App. 4th 816, 121 Cal.Rptr.2d 703 (2002) (holding that an auction platform was not liable for misrepresentation made on its website with respect to the memorabilia authenticity); *Tiffany (NJ) Inc. v. eBay, Inc.*, 600 F.3d 93 (2d Cir. 2010) (holding that an auction platform did not contribute to trademark infringement when counterfeits were auctioned on its site). But see *Fair Housing Council of San Fernando Valley v. Roomates.com, LLC*, 521 F.3d 1157 (9th Cir. 2008) (holding that such immunity does not extend to platforms when they encourage illegal behavior).

30. See, e.g., *Global Top 100 Companies by Market Capitalisation*, PWC (Mar. 31, 2018), <https://www.pwc.com/gx/en/audit-services/assets/pdf/global-top-100-companies-2018-report>. While Google and Amazon are mostly platforms, Apple and Microsoft have platforms as part of their business models (e.g., iTunes, Bing, etc.).

31. See, e.g., Eric Goldman, *Online User Account Termination and 47 U.S.C. § 230(c)(2)*, 2 U.C. IRVINE L. REV. 659 (2012).

32. See Citron & Wittes, *supra* note 10, at 463.

business models. So far, platforms have courts, scholars and policymakers on their side. Many are concerned that platform liability may be impractical, not technically feasible, and harmful to competition and innovation.³³ They fear that online platforms will not be able to distinguish illegal from legal content, which would encourage them to over-block content to avoid liability, thereby harming free speech.

Some contend that the current notice-based approach already burdens online platforms by enabling frivolous lawsuits that lead to extortive settlements.³⁴ As a policy matter, copyright holders are expected to protect their own works, rather than having others monitor potential copyright infringements. According to Volpe, three main approaches to the interpretation of internet liability vis-à-vis Section 230 have emerged: “[C]ompanies are bound by strict liability (pre-1996 approach in the U.S.), companies have blanket immunity (majority approach), and companies have conditional immunity (Seventh and Ninth Circuit approaches).”³⁵

B. *Digital Millennium Copyright Act*

Soon after the CDA was introduced, Congress passed the Digital Millennium Copyright Act (DMCA) in 1998.³⁶ Pre-DMCA, online platforms faced inconsistent liability under “vicarious liability, contributory infringement, and inducement liability” theories for providing services that subscribers used to infringe copyrighted works.³⁷ New technologies allowed online platforms to distribute copyrighted content in a peer-to-peer system.³⁸ This user-shared content raised the question of who was liable for copyright infringements. Initially, platforms faced liability for user-shared

33. See Jennifer L. Hanley, *ISP Liability and Safe Harbor Provisions: Implications of Evolving International Law for the Approach Set Out in Viacom v. YouTube*, 11 J. INT'L BUS. & L. 183, 186–89 (2012).

34. Benjamin Volpe, *From Innovation to Abuse: Does the Internet Still Need Section 230 Immunity*, 68 CATH. U. L. REV. 597, 618 (2019) (citing *Zeran v. Am. Online, Inc.*, 129 F.3d 327, 333 (4th Cir. 1997)).

35. *Id.* at 601.

36. Digital Millennium Copyright Act, Pub. L. 105-304, 112 Stat. 2860 (codified in scattered sections of 17 U.S.C.).

37. See Harris, *supra* note 2, at 810–11.

38. Martin B. Robins, *A Good Idea at the Time: Recent Digital Millennium Copyright Act § 512(c) Safe Harbor Jurisprudence—Analysis and Critique of Current Applications and Implications*, 15 TUL. J. TECH. & INTELL. PROP. 1, 4 (2012).

content,³⁹ although court decisions were inconsistent on the issue.⁴⁰ Congress reacted by clarifying the liability of platforms.

The aim of the DMCA reflects the aim of the CDA: it attempts “to facilitate the robust development and world-wide expansion of electronic commerce, communications, research, development, and education in the digital age.”⁴¹ Congress wanted to preserve “strong incentives for service providers and right holders to cooperate to detect and deal with copyright infringements that take place in the digital networked environment.”⁴²

Congress viewed service providers as a chokepoint to stop unlawful distribution and right holders (or its agents)⁴³ as the least cost avoider to monitor whether the material was infringing. The DMCA was thus intended to strike a balance between ensuring a viable business model for online service providers and the need to enforce copyright protection.⁴⁴

First, Sections 1201 and 1202 of the DMCA strengthened copyright holders’ efforts to self-protect their works from unauthorized access and copying, using watermarking, encryption, and other technological protection measures (“TPMs”).

Second, Section 512 established safe harbors for online and Internet service providers (OSPs and ISPs), shielding them from liability for the copyright infringement of users under some conditions.⁴⁵ These conditions impose technical requirements, including (1) that transmission or routing of content be done through an automatic technical process,⁴⁶ (2) that the service provider does not choose the recipients of that content,⁴⁷ and (3) that the service provider does not modify the content.⁴⁸

Under Section 512(c), online platforms are not liable for hosting or storing material that is posted by or at the direction of users.⁴⁹ However, if the service provider has actual knowledge of infringing

39. *Id.* at 19. The legislative history of the DMCA cites the following cases as prompted the adoption of Title II: *Religious Tech. Ctr. v. Netcom On-line Commcn’s Servs.*, 907 F. Supp. 1361 (N.D. Cal. 1995); *Playboy Enters., Inc. v. Frena*, 839 F. Supp. 1552 (M.D. Fla. 1993); and *Marobie-FL v. Nat’l. Ass’n. of Fire Equipment Distribs.*, 983 F. Supp. 1167 (N.D. Ill. 1997).

40. Harris, *supra* note 2, at 810.

41. S. Rep. NO. 105-190, at 1-2 (1998).

42. *Id.* at 20.

43. 17 U.S.C. § 512 specifies that the valid notification are written communication with “(i) A physical or electronic signature of a person authorized to act on behalf of the owner of an exclusive right that is allegedly infringed” among other requirements.

44. 17 U.S.C. § 512 (2010); *Costar Grp., Inc. v. Loopnet, Inc.*, 164 F. Supp. 2d 688, 698 (D. Md. 2001); *see also* Volpe, *supra* note 34, at 617.

45. 17 U.S.C. § 512.

46. *See id.* § 512(a)(2).

47. *See id.* § 512(a)(3).

48. *See id.* § 512(b)(2)(A).

49. *See id.* § 512(c)(1).

content on its service or is aware of any “facts or circumstances from which infringing activity is apparent,”⁵⁰ often called red flag knowledge, it is required to “expeditiously” take that content down.⁵¹

One way an online service provider can acquire actual knowledge of infringement is when a right holder submits a DMCA takedown notice, whose elements are laid out in Section 512(c)(3). The DMCA effectively introduced a notice-and-takedown system. Section 512(m) clarifies that service providers are not required to actively monitor their website or internet service for copyright violations.⁵² This means that the burden is on the complaining party to give notice.

In short, under the DMCA, service providers can be held liable (1) if they have knowledge that such material are stored on their servers,⁵³ (2) if they directly and financially benefit from the copyrighted material,⁵⁴ and (3) if they do not remove expeditiously or block access to the copyrighted material upon notice.⁵⁵

The DMCA does not shield online platforms from all forms of liability. But several court decisions indicate that the DMCA does shield online platforms from secondary liability.⁵⁶

C. *Stop Online Piracy Act and Other Attempts*

Some policymakers worried that the DMCA did not sufficiently protect right holders. In 2011, U.S. Representative Lamar Smith introduced the Stop Online Piracy Act (SOPA).⁵⁷ Among other things, the Act attempted to provide further tools to copyright holders to combat piracy. These tools enabled copyright holders to seek an injunction requiring online service providers, Internet search engines, payment network providers, and Internet advertising services to block access to piracy websites and cutting their source of financing.⁵⁸

Also in 2011, U.S. Senator Patrick Leahy introduced the Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act or PROTECT IP Act.⁵⁹ Like SOPA, the PROTECT IP Act would enable right holders to obtain an injunction against a nondomestic domain name, registrant, owner,

50. *See id.* § 512(c)(1)(A)(ii).

51. *See id.* § 512(c)(1)(A)(iii).

52. Harris, *supra* note 2; Volpe, *supra* note 34.

53. 17 U.S.C. § 512 (c)(1)(A).

54. *Id.* § 512 (c)(1)(B).

55. *Id.* § 512 (c)(1)(C).

56. Harris, *supra* note 2, at 802–03.

57. H.R. 3261, 112th Cong. (2011).

58. *Id.*

59. S. 968, 112th Cong. (2011).

or operator to cease and desist the operation of an internet site dedicated to infringing activities.⁶⁰

Both Acts focused on foreign websites, which could be beyond the reach of the US jurisdiction. However, cloud computing enables US firms to have a number of their storage facilities abroad to serve non-US customers. For example, as of early 2020, Google had cloud facilities in 16 countries.⁶¹ The line between countries has become blurred on the Internet.

These Acts gave more power to right holders, viewing them as the best-placed monitors and enforcers. Platforms faced limited liability and could avoid liability by abiding by the court orders. The two Acts split opinions, receiving criticisms from platforms⁶² and support from copyright holder groups.⁶³ Both failed to gather enough support.⁶⁴

III. ARGUMENTS FOR PLATFORM LIABILITY

There are several reasons why online platforms should be held liable for hosting content that violates copyright, as will be discussed

60. *Id.* An internet site dedicated to infringing activities is “a site that: (1) has no significant use other than engaging in or facilitating copyright infringement, circumventing technology controlling access to copyrighted works, or selling or promoting counterfeit goods or services; or (2) is designed, operated, or marketed and used to engage in such activities.”

61. *See Cloud Locations*, GOOGLE, <https://cloud.google.com/about/locations/> (last visited Mar. 19, 2020).

62. *See, e.g., Promoting Investment and Protecting Commerce Online: Legitimate Sites v. Parasites, Part II: Hearing Before the H. Judiciary Subcomm. on Intell. Prop., Competition, and the Internet*, 112th Cong. 200-201 (2011) (statement of Kent Walker, Senior Vice President and General Counsel, Google Inc.).

63. *See, e.g., Stop Online Piracy Act: Hearing on H.R. 3261 Before the H. Comm., on the Judiciary*, 112th Cong. 154 (2011) (statement of Michael P. O’Leary, Senior Executive Vice President, Global Policy and External Affairs, Motion Picture Association of America (MPAA)).

64. Some efforts have, however, been successful in changing platform liability about content posted on their website. For example, in response to the *Backpage* cases (*Jane Doe No. 1 v. Backpage.com, LLC*, 817 F.3d 12 (1st Cir. 2016) and *Backpage.com, LLC v. McKenna*, 881 F. Supp. 2d 1262 (W.D. Wash. 2012)), in 2018 Congress amended Section 230, closing the loophole of the safe harbor for online sex trafficking facilitators. Congress passed the Allow States and Victims to Fight Online Sex Trafficking Act of 2017, which clarifies that Section 230 “was never intended to provide legal protection to websites that unlawfully promote and facilitate prostitution and websites that facilitate traffickers in advertising the sale of unlawful sex acts with sex trafficking victims.” Pub. L. No. 115-164, 132 Stat. 1253, § 2 (2018). Some find that this amendment did not go far enough, while others find that the current system incentivizes online platforms to over-block content, threatening socially valuable speech and creating a chilling effect. Volpe, *supra* note 34, at 601; Amanda Reid, *Considering Fair Use: DMCA’s Take Down & Repeat Infringers Policies*, 24 COMM. L. & POL’Y 101 (2019). Platform liability for copyright infringement remains a topic of academic debate and a politically controversial topic.

below. First, online platforms benefit from traffic on their sites. Thus, they should internalize the losses caused by their business model (Subsection III.A). Second, online platforms govern their platforms' upload policy, which enables them to prevent copyright infringements on their platform. As potential least cost avoiders, online platforms should carry more of the enforcement burden than is currently the case (Subsection III.B). Third, technology for automated detection of illegal content has improved. Platform liability would encourage online platforms to invest in improving this technology further (Subsection III.C). Finally, platform liability would incentivize online platforms to provide better terms for licensing agreements with right holders to prevent infringements (Subsection III.D).

A. *Online Platforms Benefit from Traffic on Their Sites*

For the purpose of the discussion below, copyright has two main aims: (i) to promote the arts; and (ii) to disseminate knowledge. There is a conflict between the competing goals of ensuring access to intellectual property and providing incentives to produce information.⁶⁵ Granting holder-enforced exclusionary rights is a way to resolve this dilemma.⁶⁶

Platforms have decreased search costs for many users by facilitating communication and exchange between authors and users. With these services, platforms provide a valuable service to society. By disseminating information and content, they contribute to one of the aims of the copyright system. Authors profit from disseminating their creations, but only as long as they are able to exclude those who did not pay for using them. The copyright system ensures that authors are incentivized to create content and reach the broadest audience to profit.

Online platforms profit from the content that suppliers post and users read on their website. Platforms can generate revenues from user-generated content by charging a transaction fee or a subscription fee to buyers or sellers, or by selling advertising space. If online platforms provide access to work under the conditions of the author's copyright, they also promote the copyright-created

65. See David W. Barnes, *The Incentives/Access Tradeoff*, 9 NW. J. TECH. & INTELL. PROP. 96 (2010).

66. Whether exclusion is necessary to incentivize authors remains questionable. For example, the open software literature shows that participants have other intrinsic reasons for participating. Josh Lerner & Jean Tirole, *Some Simple Economics of Open Source*, 50 J. INDUS. ECON. 197 (2002). In many situations, exclusion provides a marginal incentive. However, in large fixed cost content (e.g., software, albums, movies), exclusion can ensure the recoupment of expended resources to produce the new knowledge. A full discussion is beyond the scope of this paper.

incentive system by providing a greater incentivize for authors to create copyrighted works.

However, if online platforms facilitate the dissemination of copyrighted work without properly compensating authors, they undermine the copyright-created incentive system. In this case, online platforms' business model generates a negative externality for authors. Allowing infringing content to be disseminated can thus be considered as part of the costs of platforms' business model. To ensure that the posting on online platforms is socially efficient, platforms should internalize the full cost of their activities; otherwise, companies will continue to have a socially inefficient level of activity and care.⁶⁷

One way to ensure online platforms internalize these costs is through imposing liability on these platforms. Holding platforms liable incentivizes them to screen postings and to invest in humans and technologies that help decrease their exposure to liability.⁶⁸ Absent liability, online platforms have little incentive to do anything about unlawful postings.⁶⁹ Online platforms benefit from expanding their network, through, for instance, ad revenue. To build a network, platforms need to attract both content uploaders and users. As users are interested in content, more content uploaders attract more users. Given this revenue structure, the absence of liability takes away any incentive for online platforms to filter unlawful postings or block users that post them.⁷⁰

Even when the community is responsible for monitoring misbehavior, under the current system, copyright holders could not compel the platforms to act—and platforms seem to have no interest in doing so—without a lawsuit and a court order.⁷¹ For example, in

67. Miriam C. Buiten et al., *Rethinking Liability Rules for Online Hosting Platforms* (Rheinische Friedrich-Wilhelms-Universität Bonn - Universität Mannheim, Discussion Paper No. CRC TR 224, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3350693.

68. See, e.g., Jennifer M. Urban et al., *Notice and Takedown in Everyday Practice* (UC Berkeley Pub. L. Research Paper No. 2755628, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2755628.

69. *Doe v. GTE Corp.*, 347 F. 3d 655, 660 (7th Cir. 2003) (discussing how the immunity under the CDA incentivizes platform to do nothing).

70. Matthew Sag, *Internet Safe Harbors and the Transformation of Copyright Law*, 93 NOTRE DAME L. REV. 499, 503 (2017); Nicholas Confessore & Gabriel J.X. Dance, *Battling Fake Accounts, Twitter to Slash Millions of Followers*, N.Y. TIMES (Jul. 11, 2018), <https://www.nytimes.com/2018/07/11/technology/twitter-fake-followers.html> (discussing the process through which Twitter was brought to start monitoring and removing fake accounts following investigations and calls in Congress for intervention by the Federal Trade Commission).

71. See, e.g., *La Park La Brea A LLC v. Airbnb, Inc.*, 285 F. Supp. 3d 1097 (C.D. Cal. 2017) (holding that a real estate owner, who contacted an online platform, could not compel the removal of properties that violate their lease from its listing); *Chicago Lawyers' Comm. for Civ. Rights Under Law, Inc. v. Craigslist*,

Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd, 545 U.S. 913 (2005), the platforms refused the help of right holders to filter for content uploaded on their platforms. The Supreme Court found Grokster liable because the business promoted its service for uses that infringe copyright and profited from those uses.⁷²

Generally, factors that would lead a party to turn a blind eye to infringements, or to even be sympathetic to infringers, render the imposition of legal liability more likely.⁷³ Thus, where a platform profits financially from widespread use of a product or service that enables infringement of copyrights, the platform should be liable for contributing to the infringement.

B. Online Platforms Govern Their Platforms

The benefits the platform enjoys from infringement are only one side of the equation. The other side concerns the means available to the platform to limit harm from infringements. Platforms govern the traffic on their sites. Through their business model and rules of participation, platforms decide who can upload content and, for subscription-based models, who can access content. Platforms can decide between a closed or open environment on their platform. Netflix has a closed environment that avoids liability by retaining complete control over all posted content. YouTube has instead opted for an open, advertisement-based model that allows users to upload content and allows anyone to watch it. By choosing this business model, YouTube eliminated the possibility to govern who can access content but can still govern who can post it.

1. Least Cost Avoider

A core efficiency principle underlying liability rules is the “least cost avoider” principle. According to this principle, legal responsibility for harm should be assigned to the party who can avoid or limit the costs of harm at the lowest cost.⁷⁴

The least cost avoider should be required to take due care to prevent harm. Under an efficient standard of care, courts expect

Inc., 519 F.3d 666, 669 (7th Cir. 2008) (holding that a platform could not be compelled to take listings down even if those listing unlawfully discriminated).

72. *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd*, 545 U.S. 913, 939–40 (2005).

73. Brief for Stuart N. Brotman et al. as Amici Curiae Supporting Plaintiffs-Appellants at 13–14, *Viacom Int’l, Inc. v. YouTube, Inc.*, 676 F.3d 19 (2d Cir. 2012) (No. 10-3270). See also Alan Q. Sykes, *The Boundaries of Vicarious Liability: An Economic Analysis of the Scope of Employment Rule and Related Legal Doctrines*, 101 HARV. L. REV. 563 (1988).

74. See generally Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

individuals to take precautions up to the point where the marginal costs of these precautions start to outweigh the marginal reduction in harm they are expected to realize.⁷⁵ Exercising due care thus amounts to taking cost-effective precautions.⁷⁶ Following the least cost avoider principle, courts should only require individuals to take these precautions when no other individuals can prevent the same harm at lower costs.

These principles of efficient harm-avoidance can also help us determine rules on contributory or secondary liability. Regarding contributory liability, the law holds individuals liable for their contributions to harm when they provide services or products that are likely to be used in ways that harm others and when they can prevent harm in a relatively cost-effective way. This is particularly relevant where the expense of identifying and pursuing those directly responsible for the harm is high.⁷⁷ With regard to secondary liability, the law gives the party able to prevent the harm at the lowest cost the incentive to take steps towards this goal. If this party is not liable, she may not be motivated to take reasonable precautions. Similarly, individuals or organizations are liable for the conduct of others when they can efficiently control that conduct.⁷⁸ In this way, the law requires those who can prevent harm efficiently to do so.

The principles of efficient harm-avoidance apply to copyright law. Copyright liability endeavors to make the person responsible who can avoid harm at the lowest cost.⁷⁹ Those who want to disseminate copyrighted works are responsible for obtaining permission or liable if they do not. The fact that the harm caused by copyright infringements is the result of online activities should make no difference for liability.⁸⁰

Based on these principles, platforms should face some form of liability for copyright-infringing posts of their users, as they are often

75. WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* 86–107 (1987).

76. This version of rationality was first discussed in *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947), where Judge Learned Hand compared the expected benefits of taking care to the cost of taking care. A defendant's "duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) The probability that [an accident occurs]; (2) the gravity of the resulting injury, if [the accident occurs]; (3) the burden of adequate precautions. Possibly it serves to bring this notion into relief to state it in algebraic terms: if the probability be called P; the injury, L; and the burden, B; liability depends upon whether B is less than L multiplied by P: i.e., whether B less than PL." *Id.* at 173.

77. Brotman et al., *supra* note 732, at 6.

78. *Id.*

79. See RONALD A. CASS & KEITH N. HYLTON, *ECONOMICS OF INTELLECTUAL PROPERTY LAW: PROPERTY RIGHTS IN THE WORLD OF IDEAS* § 6 (2011); LANDES & POSNER, *supra* note 75, at 85–123.

80. Brotman et al., *supra* note 733, at 7. See also Frank H. Easterbrook, *Cyberspace and the Law of the Horse*, 1996 U. CHI. LEGAL F. 207 (1996); *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913 (2005).

the least cost avoiders for preventing or limiting harm that results from these infringements.⁸¹ There are several reasons why online platforms are often the least cost avoiders.

First, online platforms are best placed to *monitor infringing content*, because they have better information about the content they host than right holders. Online platforms could monitor the content they host within their own system whereas right holders need to monitor the content hosted on a wide array of platforms.⁸² This is not to say that filtering technology would allow platforms to detect illegal content perfectly. Filtering algorithms still have limitations, as will be further discussed in Section III.C. Nevertheless, even if platforms cannot perfectly detect all infringements, they are best positioned to spread the cost of infringement amongst all their lawful and unlawful content. Platforms can spread the cost of filtering software over more content than a single copyright holder. In cases where deterrence is prohibitively costly, platforms are the “most efficient risk bearer”.⁸³

Second, because of their information advantage, platforms can likely *identify infringers* at lower costs than right holders. Platforms can observe the Internet Protocol address from where the content was sent whereas right holders cannot. The users who share infringing content should face primary liability. While liability of infringing users is necessary for an efficient liability regime, it is not enough. Users are hard to identify for right holders, given that platforms allow them to share content anonymously. Sophisticated users may even take steps to conceal their tracks. Even if identified, users rarely have sufficient assets to pay for the losses they impose.⁸⁴ Platforms, which can be easily identified by right holders, are in a better position than right holders to track down users’ identity.

Third, platforms have instruments at their disposal to *stop infringements* since they control access to the content. Platforms can filter what content is disseminated. Platforms can block further uploads from addresses associated with infringement uploads. Through their rules of participating, platforms can also incentivize users to report infringing content.

Finally, from an enforcement cost perspective, imposing liability on platforms creates *judicial efficiencies*, i.e., *economies of scale*. Right holders need only sue one entity instead of all uploaders because large platforms act as a chokepoint through which content must pass before being made available. Focusing on these chokepoints decreases the number of litigations.

81. Brotman et al., *supra* note 733, at 13.

82. *See, e.g.*, Basic Books, Inc. v. Kinko’s Graphics Corp., 758 F. Supp. 1522 (S.D.N.Y. 1991).

83. Brotman et al., *supra* note 733, at 6.

84. Doug Lichtman & Eric Posner, *Holding Internet Service Providers Accountable*, 14 SUP. CT. ECON. REV. 221, 223, 229–30 (2006).

Aside from litigation costs, enforcement costs also include costs of filing notices for right holders, the costs of filtering and responding to notices for online platforms, and the error costs involved in this. Under Section 512, infringement search costs are placed squarely on the right holders. Courts have affirmed this cost allocation even as the scale of potential infringements has risen, as will be discussed further below.⁸⁵

While notice-and-takedown systems place high costs on right holders, platforms carry costs of filtering their content on their own. Platforms often dispute that they are the least cost avoider or most efficient risk bearer and point out the high costs associated with filtering. Platforms claim that it would be too expensive or futile to monitor each misbehavior.⁸⁶

However, platforms have found ways to overcome these expenses if sufficiently incentivized. For example, platforms have attempted to enter the Chinese market but to do so they had to comply with China's censorship rules and potentially to help the Chinese government's surveillance efforts.⁸⁷ Both Facebook and Google have recently attempted to enter this market and develop special filters.⁸⁸ Both faced pushback from various quarters,⁸⁹ but, in both cases, research had begun on the censorship and monitoring

85. See, e.g., *Perfect 10, Inc. v. CCBill, LLC*, 488 F.3d 1102, 1114 (9th Cir. 2007); *Hendrickson v. eBay, Inc.*, 165 F. Supp. 2d 1082, 1093 (C.D. Cal. 2001).

86. "An online service could hire a staff to vet the postings, but that would be expensive and may well be futile: if postings had to be reviewed before being put online, long delay could make the service much less useful, and if the vetting came only after the material was online the buyers and sellers might already have made their deals." Chicago Lawyers' Comm. for Civ. Rights Under Law, Inc. v. Craigslist, Inc., 519 F.3d 666, 668–69 (7th Cir. 2008), *as amended* (May 2, 2008).

87. Eli Meixler, *Here's Why Google Employees Are Protesting the Company's Planned Expansion in China*, TIME (Nov. 28, 2018), <http://time.com/5465288/google-employees-protest-dragonfly-china/>.

88. Facebook attempted to re-enter the market by deploying better filtering technology after being banned in China. Mike Isaac, *Facebook Said to Create Censorship Tool to Get Back Into China*, N.Y. TIMES (Nov. 22, 2018), <https://www.nytimes.com/2016/11/22/technology/facebook-censorship-tool-china.html>. Google faced the same problem in China and planned to create a search engine for the Chinese market. Kate Conger & Daisuke Wakabayashi, *Google Employees Protest Secret Work on Censored Search Engine for China*, N.Y. TIMES (Aug. 16, 2018), <https://www.nytimes.com/2018/08/16/technology/google-employees-protest-search-censored-china.html>.

89. Google has faced pushback from its employees. The employees petitioned against this project citing Google's motto "Don't be evil," which the employees interpret to mean that the company should put human rights before the company's bottom-line. Conger & Wakabayashi, *supra* note 88. Facebook's withdrawal seems to be government motivated. See, e.g., Paul Mozur & Sheera Frenkel, *Facebook Gains Status in China, at Least for a Moment*, N.Y. TIMES (Jul. 24, 2018), <https://www.nytimes.com/2018/07/24/technology/facebook-china-subsi-dary.html>; Paul Mozur, *China Said to Quickly Withdraw Approval for New Facebook Venture*, N.Y. TIMES (Jul. 25, 2018), <https://www.nytimes.com/2018/07/25/business/facebook-china.html>.

technology. These two examples show that platforms can—even though costly—monitor and filter if sufficiently incentivized.

Liability for online platforms would provide such an incentive for platforms to further develop filtering technology, as will be discussed in Section III.C. Moreover, the core question is not so much whether filtering is costly, but whether filtering is the most cost-effective means to avoid harm from copyright infringements and whether it is justified in light of such harm. If platforms are not required to monitor, right holders must expend resources to limit harm from infringements. The question, therefore, is how the enforcement burden should be divided between right holders and online platforms.

2. The Enforcement Burden Under Current Case Law

The DMCA was designed to balance interests in the growth of online business models with interests in protecting intellectual property.⁹⁰ The DMCA safe harbor clarifies the circumstances in which platforms face no liability.⁹¹ A broad reading of the DMCA safe harbor grants online platforms some immunity although they could be best positioned to prevent, limit or eliminate harm from copyright infringements.⁹² However, a narrow reading of the safe harbor would be consistent with the least cost avoidance principle. Under current rules, online platforms can await notice from copyright holders before removing copyright infringing content.⁹³

Courts have continued to interpret the DMCA in favor of online platforms. In *Viacom Int'l, Inc. v. YouTube, Inc.*, the Second Circuit clarified that the DMCA does not require online platforms to actively monitor their sites for infringing conduct and material.⁹⁴ The court also held that online platforms that fall within the DMCA safe harbor provisions will not be liable under indirect liability theories of vicarious and contributory infringement. The court concluded that “red flag” knowledge required knowledge of “specific and identifiable instances of infringement,” rejecting the idea that generalized knowledge of rampant infringement on their sites would give online platforms a duty to act.⁹⁵

90. H.R. Rep. NO. 105-551, pt. 2, at 23 (1998).

91. Brotman et al., *supra* note 73, at 13 (citing H.R. Rep. NO. 105-551, pt. 1, at 11 (1998)); *Columbia Pictures Indus., Inc. v. Fung*, No. CV 06-5578, 2009 WL 6355911, at *15 (C.D. Cal. Dec. 21, 2009) (“In many ways, the Digital Millennium Copyright Act is simply a restatement of the legal standards establishing secondary copyright infringement.”).

92. Lital Helman & Gideon Parchomovsky, *The Best Available Technology Standard*, 111 COLUM. L. REV. 1194, 1208–09 (2011); Brotman et al., *supra* note 73, at 13–14; *Viacom Int'l, Inc. v. YouTube, Inc.*, 676 F.3d 19 (2d Cir. 2012).

93. *Viacom Int'l*, 676 F.3d at 35.

94. *Id.*

95. *Id.* at 31.

According to the music industry,⁹⁶ this interpretation amounts to a URL-by-URL notification requirement because providing a URL is the only way to provide “specific and identifiable infringement.”⁹⁷ From the perspective of copyright holders, having to find and report each individual URL is a considerable burden. They are required to expend resources to identify each individual instance of the copyright infringement for the online platform to have to take it down.⁹⁸

Copyright holders have attempted to obtain some damages from infringement-enabling platforms and technologies without much success. For example, in *Sony Corp. of America v. Universal City Studios, Inc.*, the Supreme Court discussed whether the manufacturer of a recording device could be held liable for incentivizing and contributing to copyright infringement. In this opinion, the Court ruled that these devices had other non-infringing uses.⁹⁹ As such, the “sale of such equipment to the general public does not constitute contributory infringement of respondents’ copyrights.”¹⁰⁰ While the Court accepted secondary liability under copyright law for individuals or entities whose actions encouraged or facilitated infringement, it decided the mere sale of a device that was primarily used for purposes that did not infringe copyrights was not sufficient.¹⁰¹

Online platforms that do not merely enable, but induce infringements, have been found liable.¹⁰² In *Grokster*, the Supreme Court found that a file-sharing platform was liable for inducing copyright infringement because it explicitly encouraged platform suppliers to upload copyrighted material.¹⁰³ While both technologies in *Sony* and *Grokster* allowed copying copyrighted material, *Grokster*’s explicit encouragement of its users to use the technology to infringe the law led to the imposition of liability.¹⁰⁴ The platforms discussed in *Grokster* were found liable for inducing infringement because one platform actively “promot[ed] its ability to provide particular,

96. Am. Ass’n of Indep. Music et al., Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment (Apr. 1, 2016) [hereinafter Music Community Comments], <https://www.regulations.gov/document?D=COLC-2015-0013-89806>.

97. *Id.* See also Daniel Etcovitch, *DMCA Sec. 512 Pain Points: Music and Technology Industry Perspectives in Juxtaposition*, 30 HARV. J.L. & TECH. 547, 554 (2017).

98. Etcovitch, *supra* note 9797, at 554–55.

99. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 442–56 (1984).

100. *Id.* at 456.

101. *Id.* at 442.

102. *Viacom Int’l, Inc. v. YouTube, Inc.*, 676 F.3d 19, 37–38 (2d Cir. 2012).

103. *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913, 940 (2005).

104. *Id.* at 941.

popular copyrighted materials.”¹⁰⁵ In *Grokster*, the Court noted that “there is no evidence that either company made an effort to filter copyrighted material from users’ downloads or otherwise impede the sharing of copyrighted files.”¹⁰⁶ The Court seemed to signal that non-action could constitute circumstantial evidence for the finding that platforms induce infringement.

Most online platforms have been careful to avoid communication to users that could be found to induce infringement.¹⁰⁷ Instead, platforms create ways for copyright holders to file a complaint, and answer takedowns expeditiously when notified of infringing content, following the DMCA affirmative defense of lacking knowledge. For example, YouTube lets copyright holders file claims of unauthorized posting.¹⁰⁸

Notice-and-takedown systems rely on right holders to monitor the platforms. Right holders can send takedown notices to online platforms requesting that infringing content be removed from their sites. Users can challenge removal by sending a counter notice, in which case right holders can choose to file an infringement suit.

Faced with large-scale infringement on the internet, copyright holders have had to adapt their tactics. Large right holders make heavy use of automated “bots” to search for copyright violations and send automated takedown notices to platforms, often relying on third-party rights enforcement organizations.¹⁰⁹ These systems impose a substantial cost on right holders,¹¹⁰ while leaving the platforms to deal with these notices. Platforms complain that misidentified or imprecise notices increase costs of responding to notices.¹¹¹ Platforms have responded by automating their own

105. *Id.* at 926.

106. *Id.*

107. Knowing that Napster was being sued for inducing infringement, the Court in *Grokster* cited the following advertisement as enticing speech: “Napster Inc. has announced that it will soon begin charging you a fee. That’s if the courts don’t order it shut down first. What will you do to get around it?” . . . ‘#1 alternative to Napster[,]’ [and] . . . ‘[w]hen the lights went off at Napster . . . where did the users go?’” *Id.* at 925.

108.

If your copyright-protected work was posted on YouTube without authorization, you may submit a copyright infringement notification. Be sure to consider whether fair use, fair dealing, or a similar exception to copyright applies before you submit. These requests should only be sent in by the right holder or an agent authorized to act on the owner’s behalf. The fastest and simplest way to submit a copyright takedown notice is through our webform. We recommend using a computer for the easiest method.

Submit a Copyright Takedown Notice, YOUTUBE HELP, <https://support.google.com/youtube/answer/2807622?hl> (last visited Mar. 19, 2020).

109. Urban et al., *supra* note 68.

110. *Id.*

111. Jennifer M. Urban et al., *Takedown in Two Worlds: An Empirical Analysis*, 64 J COPYRIGHT SOC’Y USA 483 (2017); see also Daniel Seng, *The State of the*

notice- and takedown system in accordance with the DMCA requirements.¹¹² Both sets of automated systems have their own flaws and inaccuracies. At the same time, individual right holders without access to automated systems struggle to enforce their copyrights online.¹¹³

Online platforms have argued that right holders are best placed to identify and verify unauthorized content.¹¹⁴ Right holders would be better able to bear the enforcement costs than platforms because only they are aware of whether particular instances are licensed.¹¹⁵ Online platforms moreover argue that the high burden of proof showing knowledge of infringement is necessary because lowering it would essentially shift the burden of monitoring online platforms to the platforms. This, according to online platforms, would create a barrier to entry to the industry and would stifle innovation.¹¹⁶

At the same time, right holders have a legitimate grievance with respect to the high costs of enforcing their rights. Even if right holders go after uploaders, they rely on the cooperation of online platforms. First, platforms are often unwilling to disclose information about uploaders. For example, in *Grokster*, right holders went after platforms that enabled the distribution of their copyrighted movies.¹¹⁷ In this case, the Court noted that the defendant “not only rejected another company’s offer of help to monitor infringement, . . . but blocked the Internet Protocol addresses of entities it believed were trying to engage in such monitoring on its networks.”¹¹⁸ Second, platforms may be unwilling to share information about end users. Some copyright holders have attempted to go after end users. For example, in *Recording Industry Ass’n of America, Inc. v. Verizon Internet Services, Inc.*, 351 F. 3d 1229 (D.C. Cir. 2003), an association of

Discordant Union: An Empirical Analysis of DMCA Takedown Notices, 18 VA. J.L. & TECH. 369 (2014).

112. Seng, *supra* note 111.

113. *See, e.g.*, The Arts and Entertainment Advocacy Clinic at George Mason University School of Law, Additional Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, at 11 (Feb. 23, 2017), <https://www.regulations.gov/document?D=COLC-2015-0013-92439>.

114. Facebook, Inc., Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, at 3 (Apr. 1, 2016), <https://www.regulations.gov/document?D=COLC-2015-0013-92471>; *see also* Etcovitch, *supra* note 97, at 553.

115. SoundCloud Operations, Inc., Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, at 8 (Apr. 1, 2016) [hereinafter SoundCloud Comments], <https://www.regulations.gov/document?D=COLC-2015-0013-90151>.

116. Amazon.com, Inc., Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, at 9–10 (Apr. 1, 2016), <https://www.regulations.gov/document?D=COLC-2015-0013-90706>.

117. *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913 (2005).

118. *Id.* at 926–27 (internal citation omitted).

copyright holders was hoping to obtain subpoenas to force platforms to disclose the physical addresses and names of the content users. The D.C. Circuit ruled that Section 512(h) of the DMCA did not grant the copyright holders the ability to subpoena the internet service providers to obtain the names of subscribers.¹¹⁹

3. Fair Use

Online platforms often contend that any form of liability or general monitoring would be impossible to reconcile with the fair use doctrine. Fair use is an exception to the exclusive rights granted by copyright and can only be determined *ex post* by a judge.¹²⁰ Rules on fair use are designed to allow reproducing a reasonable portion of a copyrighted work without permission when necessary for a legitimate purpose which is not competitive with the copyright owner's market for his work.¹²¹

The question is how far fair use reaches in the context of online platforms. Google has been at the forefront of the debate surrounding the sharing of sections of copyrighted material with its Google Books library. Some authors view the project as infringing on their rights and diminishing their ability to profit from their work while others view the project as an advertisement.¹²² But even when Google actively participated in the alleged infringing activity, it was not automatically liable. It could still deploy traditional defenses such as the fair use doctrine.

In *Lenz v. Universal Music Corp.*, 815 F.3d 1145 (9th Cir. 2016), the Ninth Circuit held that right holders must consider fair use before submitting a takedown notice to an online platform. The Court based this on the requirement in § 512(c)(3)(A)(v) that the owner have a good faith belief that the material's use was infringing.¹²³ According to online platforms, this is necessary to prevent non-infringing material from being removed in notice-and-takedown systems.¹²⁴ Right holders, in turn, complain that this eliminates the

119. *Recording Indus. Ass'n of Am., Inc. v. Verizon Internet Servs., Inc.*, 351 F.3d 1229 (D.C. Cir. 2003).

120. *See* 17 U.S.C. § 107 (2012). The factors are the "purpose and character of the use," the "nature" of the work, the "amount and substantiality of the portion" used, and the "effect of the use upon the potential market" for the work.

121. Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 COLUM. L. REV. 1600 (1982).

122. *See, e.g.*, Frank Müller-Langer & Marc Scheufen, *The Google Book Search Settlement: A Law and Economics Analysis*, 8 REV. ECON. RES. ON COPYRIGHT ISSUES 7 (2011).

123. *Lenz v. Universal Music Corp.*, 815 F.3d 1145, 1151–53 (9th Cir. 2016). *See also* Etcovitch, *supra* note 97, at 558.

124. Mozilla, Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, at 1–3 (Apr. 1, 2016) [hereinafter Mozilla Comments], <https://www.regulations.gov/document?D=COLC-2015-0013-92432>.

possibility of issuing automated takedowns. Requiring human review of any takedown notice makes the enforcement process for right holders substantially more expensive.

C. Platform Liability Could Improve Filtering Technology

While notice-and-takedown systems allow copyright holders to enforce their rights, it would be cheaper for them if infringing content would not appear on online platforms at all, of course. Potentially, filtering content could also be less costly for platforms than maintaining a notice-and-takedown system, especially as filtering technology becomes more accurate. The accuracy of filtering technology, in turn, likely depends on the investments online platforms make to develop it.

In the two decades since the CDA was introduced, the technology available to online platforms for governing traffic on their sites has evolved. Technology—whether it is machine learning and artificial intelligence—has progressed in leaps and bounds during that time. Implementations of these technologies are now able to filter even complicated text.¹²⁵ Some online platforms have invested in these technologies when incentivized, for instance by developing their own monitoring system.¹²⁶ For example, YouTube¹²⁷ implemented a filter that puts uploaded material through an algorithm comparing the upload to a database of known copyrighted material. The algorithm is not perfect: some protected work could still fall through the cracks and be posted on the site.

While algorithms may fail to identify illegal material (false negatives), there is a growing concern that they mistakenly remove legal material (false positives). Over-blocking can have several causes. One may be uncertainties in copyright law, for instance as to the scope of fair use, as discussed in Subsection III.B.3. Other causes include the automation of enforcement, the frequent presence of both infringing and non-infringing uses on the same platform, and the high legal costs of defending one's right to use copyrighted material.¹²⁸ It appears that automated systems have two opposing effects on the accuracy of notices. On the one hand, systems such as

125. Shoko Oda, *This Media Startup Is Beating the Competition with a Newsroom Run by Robots*, BLOOMBERG (May 27, 2018) (discussing machine learning and artificial intelligence as a way to filter out news), <https://www.bloomberg.com/news/articles/2018-05-27/the-airline-geek-trying-to-build-a-media-giant-with-no-reporters>.

126. Raymond Zhong, *Alphabet's Plans for a China Comeback Go Beyond Google Search*, N.Y. TIMES (Aug. 24, 2018), <https://www.nytimes.com/2018/08/24/technology/google-china-waymo.html>.

127. *Viacom Int'l, Inc. v. YouTube, Inc.*, 940 F. Supp. 2d 110 (S.D.N.Y. 2013).

128. Ben Depoorter & Robert Kirk Walker, *Copyright False Positives*, 89 NOTRE DAME L. REV. 319 (2013).

Google's preferential "Trusted Copyright Removal Program" have improved the accuracy by providing clear and structured forms, coupled with sanctions for submitting inaccurate notices. On the other hand, so-called "robo-notices," which can automatically be generated in large numbers, can amplify errors that affect large quantities of works.¹²⁹

The current DMCA safe harbor for online platforms may disincentivize platforms to innovate in filtering technology.¹³⁰ In the worst case scenario, the law may incentivize online platforms to slow their innovation in technology or understate the capabilities of their technologies to continue benefiting from the legal safe harbors.¹³¹ Platform liability, however, would incentivize online platforms to invest in better filtering technology, so that detecting copyright-infringing material will become cheaper overtime. Since monitoring technology remains expensive, policymakers may worry how imposing liability on platforms would affect innovation. In such a case, if Congress is concerned that removing the CDA-style immunity would affect startups and innovation, then it can carve out a *de minimis* exemption.

D. Platform Liability Would Encourage Licensing Agreements

As discussed above, online platforms defend the safe harbor by pointing to the high enforcement costs associated with a liability rule, given that algorithms are imperfect and human involvement is necessary. They argue that liability would lead platforms to err on the side of caution and over-remove content, which would reduce users' access to information and freedom of speech.¹³²

This argument overlooks an obvious alternative to upload filters to avoid liability: obtaining authorization to reproduce the copyrighted material from right holders. The more works that are covered by licensing agreements between right holders and platforms, the more content can be shared by users without the need for upload filters. Of course, platform liability is no prerequisite for licensing agreements. Right holders also have an interest in concluding licensing agreements with platforms under the safe harbor.

However, platforms have less incentive to conclude such agreements, since they can avoid liability for any illegal material

129. Kris Erickson & Martin Kretschmer, *Empirical Approaches to Intermediary Liability*, in THE OXFORD HANDBOOK OF INTERMEDIARY LIABILITY ONLINE 8 (Giancarlo Frosio ed., 2019).

130. Lital Helman & Gideon Parchomovsky, *The Best Available Technology Standard*, 111 COLUM. L. REV. 1194, 1202 (2011).

131. Cf. Salik K. Mehra & Marketa Trimble, *Secondary Liability, ISP Immunity, and Incumbent Entrenchment*, 62 AM. J. COMP. L. 685, 687 (2014).

132. Mozilla Comments, *supra* note 124, at 5.

posted on their platforms. Opponents to the safe harbor rules contend that the safe harbor allows online platforms to exploit the DMCA's safe harbor provisions to establish unfair negotiating leverage in music-licensing deals.¹³³ This would allow them to generate immense profits at the expense of content creators and other right holders.¹³⁴

Exploitation or not, the DMCA's safe harbor affects licensing negotiations between right holders and online platforms by allowing platforms to spend minimal effort removing infringing content. Because right holders have difficulty fighting infringement without support from platforms, right holders have an incentive to agree to unfavorable licensing deals with these platforms.¹³⁵ The safe harbor thus allows technology companies to capture part of the revenues from intellectual property.¹³⁶ Liability could counterbalance this.

Online platforms argue that their services add value for right holders. They argue that online platforms help drive sales for, for instance, musicians because they allow consumers to discover their music.¹³⁷ They contend that the benefits they produce for the music industry justify the premium that the music industry pays in the form of reduced licensing fees.¹³⁸ Google claims to have “sent over \$3 billion to the music industry” directly by paying licensing fees to record labels.¹³⁹

This issue ties into the debate on whether there is a “value gap” between the revenue of online platforms and content creators. The question is whether online platforms have taken a piece of the pie of the music industry or whether they have enlarged the pie.¹⁴⁰ According to the entertainment industry, online platforms have created a value gap, whereas the music industry argues that industry revenue and profitability have been declining for years, even though the amount of music being listened to is rising.¹⁴¹ Online platforms, in response, argue that they have enabled the music industry to

133. Micah Singleton & Ben Popper, *The Music Industry Cranks up the Volume in Its Fight Against YouTube*, THE VERGE (June 3, 2016, 12:48 PM), <https://www.theverge.com/2016/6/3/11852146/music-industry-fighting-youtube-dmca>.

134. INT'L FED'N FOR THE PHONOGRAPHIC INDUS., GLOBAL MUSIC REPORT 2017: ANNUAL STATE OF THE INDUSTRY 25 (2017), <http://www.ifpi.org/downloads/GMR2017.pdf>. See also Daniel L. Lawrence, *Addressing the Value Gap in the Age of Digital Music Streaming*, 52 VAND. J. TRANSNAT'L L. 511, 513 (2019).

135. Etcovitch, *supra* note 97, at 551.

136. Music Community Comments, *supra* note 96, at 12–13.

137. Google, Inc., Comment Letter on U.S. Copyright Office Section 512 Study: Notice and Request for Public Comment, 1–2 (Apr. 1, 2016) [hereinafter Google Comments], <https://www.regulations.gov/document?D=COLC-2015-0013-90806>.

138. Etcovitch, *supra* note 97, at 553.

139. Google Comments, *supra* note 137, at 2.

140. See, e.g., Lawrence, *supra* note 134, at 511.

141. Music Community Comments, *supra* note 96, at 12–13.

expand its audience and create new avenues for success, reducing the power of music labels.¹⁴² According to platforms, the DMCA has created a market of online platforms that generates more value than it erodes.¹⁴³

IV. A MODEL OF LIABILITY

A. Market-Based Approach

Online copyright infringement involves a content uploader who posts copyrighted material on the content distributor's platform where a content consumer retrieves it. Currently, when illegal material is viewed, the content providers and consumers violate copyright laws, but platforms do not.

Policymakers often discuss two options when discussing regulations: (1) a command-and-control approach and (2) a market-based solution.¹⁴⁴

A command-and-control approach would look like either a blanket prohibition on all platforms or a promulgation that platforms must use a specific technology to filter content. However, prohibiting platforms would harm society and promulgating a specific technology would fail to account for the speed of

142. SoundCloud Comments, *supra* note 115, at 2–3.

143. *Id.* at 3.

144. For example, in Europe, the European Parliament passed the Directive on Copyright in the Digital Single Market, formally the Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC. Article 17(4) specifies that

If no authorisation is granted, online content-sharing service providers shall be liable for unauthorised acts of communication to the public, including making available to the public, of copyright-protected works and other subject matter, unless the service providers demonstrate that they have:

(a) made best efforts to obtain an authorisation, and

(b) made, in accordance with high industry standards of professional diligence, best efforts to ensure the unavailability of specific works and other subject matter for which the right holders have provided the service providers with the relevant and necessary information; and in any event

(c) acted expeditiously, upon receiving a sufficiently substantiated notice from the right holders, to disable access to, or to remove from their websites, the notified works or other subject matter, and made best efforts to prevent their future uploads in accordance with point (b).

Faced with the possibility of liability, Google campaigned against this law and made an emotional appeal to its user base to lobby their legislative representatives. See, e.g., Cécile Barbière, *How YouTube Makes Users Lobby In-House against Copyright Directive*, EUROACTIV (Dec. 7, 2018), <https://www.euractiv.com/section/digital/news/how-youtube-makes-users-lobby-in-house-against-copyright-directive/>.

technological changes and the fact that policymaking lags behind such changes.

A market-based solution would create financial incentives for platforms to address the infringement problem. Imposing liability is an example of such a market-based solution. In a market-based approach, policymakers let the market participants determine the cost of infringement. This price can be arrived at through settlement or damages for past infringements and negotiating licenses to avoid future infringement. Policymakers determine some costs of infringement (e.g. fines or damages), and let the copyright holders and infringers decide or litigate over these costs.

Policymakers can impose liability on any of three agents: the individual uploading the material (content uploader), the content distributor (platform), and the content consumer (platform end-user). The content uploader and the platform end-users remain the primary and secondary infringers. They face strict liability for infringing on copyrighted works. If policymakers decide not to impose any liability, the right holder bears the economic cost of the breach.

In the following subsection, we compare various liability rules that platforms could face. Against the background of right holders' struggle to enforce their rights against content uploaders and platform end-users that we discussed above in Section III.B.2, the sections below assume that uploaders and users are either judgment proof or cannot be found.¹⁴⁵

B. No Liability

This section investigates the incentives of platforms without liability for the content they host. In our set-up, platforms need to account for the effect their distribution has on creation. Infringement affects platforms' revenues today but also in the future, because infringement reduces authors' willingness to create. Depending on the cost of filtering, platforms may start discouraging infringing uploads to encourage creation.

Assume that the total content uploaded on a Platform i in period t is U_{it} such that the content is the sum of the non-infringing content x_{it} and infringing content y_{it} uploaded:

145. Alternatively, policymakers could decide to let the current liability rest on content uploaders and users and instead impose a duty to disclose on platforms under a subpoena power. This system would raise other concerns such as abuses, breach of privacy, etc. Another alternative would be to hold all these parties joint and severally liable. It would incentivize platforms to take action and offer platforms the opportunity to recover from the primarily liable agents. It would require assigning fault onto the three parties but it would ensure that all parties would internalize some cost of their actions. While such a thought experiment is interesting, it is beyond the scope of this paper.

$$U_{it} = x_{it} + y_{it}$$

However, not every upload is posted on the site. Let P_{it} be the posted content:

$$P_{it} = \phi_{it}(x_{it}, y_{it})$$

where ϕ_{it} represents the filtering the platform implements.

For simplicity, assume that technology posts all legitimate content and filters out the infringing content with f_{it} accuracy:

$$P_{it} = x_{it} + (1 - f_{it})y_{it}$$

such that $f_{it} \in [0,1]$. When $f_{it} = 0$, the company does not successfully detect any infringing content, i.e., it does not filter. If $f_{it} = 1$, then $P_{it} = U_{it}$. If $f_{it} = 1$, the filter successfully eliminates all the infringing content. It is thus assumed that the technology does not filter non-infringing content or over-block, meaning that there are no false positives. This assumption is revisited below.¹⁴⁶

Platform i 's profits depend on the amount of content P_{it} posted on its site, regardless of whether the uploads infringe someone's copyright.

Assume for simplicity that uploaders, users, and creators are three distinct groups. This means that uploaders and users do not consider the negative effects of copyright infringements on creators' revenues. Assume that content grows every period as network effects attract more users who are likely to contribute. As total content grows, so does the amount of infringing content. More infringing content discourages the potential creators from creating new content. This reflects the chilling effect of copyright infringement:

$$x_{it+1} = g(x_{it}, f_{it}, y_{it})$$

where the function g is the transition function. It is increasing in the amount of non-infringing content $\frac{\partial g}{\partial x_{it}} > 0$ and decreasing in the number of infringing posts. This means that g is increasing as a function of the filter f_{it} (i.e., $\frac{\partial g}{\partial f_{it}} > 0$) all else being equal, and g is decreasing as a function of infringing uploads (i.e., $\frac{\partial g}{\partial y_{it}} < 0$) all else being equal.

Infringers' behavior depends on the amount of non-infringing material and the filtering by platforms:

$$y_{it+1} = h(x_{it}, f_{it})$$

As creators create more original content, uploaders have more material to upload, i.e., $\frac{\partial h}{\partial x_{it}} > 0$. If uploaders know their content is never posted because of filtering, they become discouraged such that $\frac{\partial h}{\partial f_{it}} < 0$ and $\frac{\partial^2 h}{\partial f_{it}^2} < 0$.

The platform's revenue is expressed by $r(P_{it})$. This revenue function depends on the number of uploads and the filtering process.

146. See discussion *infra* subsection IV.F.

The underlying assumption is that more posted content leads to more traffic, views, and revenue.¹⁴⁷ The revenue function $r(\cdot)$ is thus assumed to be continuous and increasing as a function of uploads P_{it} , i.e., $\frac{\partial r}{\partial P_{it}} > 0$.

Based on these assumptions, the platform would simply maximize the number of uploads to the website. However, the platform must consider the impact their behavior has on the copyright system. By hosting infringing material on its site in period 1, the platform decreases the ability of right holders to profit from their creation, lowering their incentives to produce new material in period 2, and thereby reducing the number of uploads in period 2.

In other words, the platform faces a dynamic problem and its profit is:

$$\Pi_{it} = r(P_{it}) - c(f_i, U_{it}) + \delta \Pi_{it+1}$$

where δ is the discount rate and $c(\cdot)$ is the cost function. This cost is increasing as a function of the filtering accuracy f_i and number of uploads.

Assume that the company sets the same level of filtering every period. The platform would attempt to maximize the following equation:

$$\Pi_{it} = r(P_{it}) - c_f(U_{it}, f_i) + \delta[r(P_{it+1}) - c_f(U_{it}, f_i)] \quad (1)$$

Depending on the relative revenue and cost functions, the platforms may prefer not to filter or have some form of filtering. If the platform only considers its current payoff, then having a higher filter level decreases its income. The platform would be better off with no filter. However, in the next period, the platform internalizes some of the cost of infringement through lower content creation. Reduced content creation reduces the platform's revenues such that the filter level that maximizes its profits may be more than zero.

For platforms, the normative issue revolves around whether filtering is cheap or expensive, and whether there are economies of scale in filtering.¹⁴⁸ Depending on how the costs and benefits of

147. Content distributors are two-sided platforms that rely on network externalities and feedback loops. The more content posted, the more consumers platforms can attract. The larger the audience, the more content providers post on their platforms. See, e.g., Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EUR. ECON ASS'N 990 (2003); Jean-Charles Rochet & Jean Tirole, *Two-Sided Markets: A Progress Report*, 37 RAND J. ECON. 645 (2006); David S. Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, 20 YALE J. ON REG. 325 (2003); David S. Evans & Michael Noel, *Defining Antitrust Markets When Firms Operate Two-Sided Platforms*, 3 COLUM. BUS. L. REV. 667 (2005).

148. We assume that the platform is a monopolist. If it is assumed that the platform faces competition from other platforms, the platform's incentives to filter are likely to go down. The reason is that some market participants may free ride off the effort of others to filter because they do not internalize all the benefits of their filtering. In other words, filtering may be further suboptimal in a competitive

filtering change with the number of posts, the profit functions resemble panel A (filtering technology benefits can outweigh the costs) or panel B (filtering technology benefits never outweigh the costs) in Figure 1.

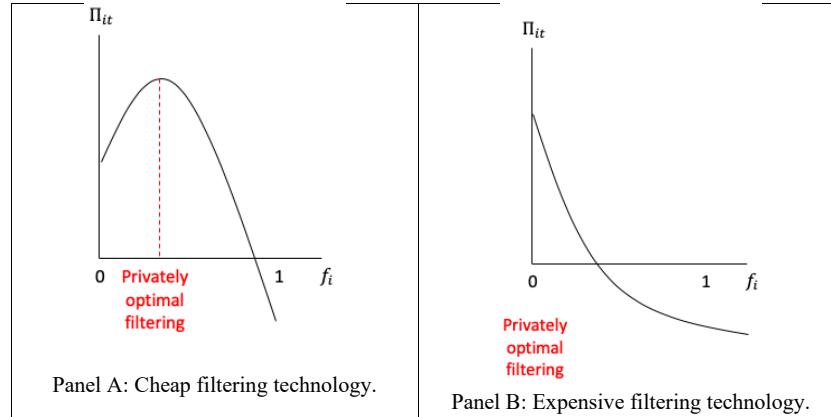


Figure 1: Profit and Filtering Technology

Table 1 summarizes the discussion above. Without liability, content creators pay for the copyright infringements on online platforms. They have less incentive to create content, reducing the material that platforms can disseminate through user uploads.

Table 1: No Liability Summary

	Copyright Holder	Content Distributor
Monitoring	No incentive to monitor because cannot enforce rights.	Some incentive to filter, depending on filtering costs and the discouraging effect of infringements on content creation.
Enforcing	No litigation and recoupment option.	Platforms avoid enforcement and pass on the costs of infringements enabled by their business model onto right holders.

environment even if the platforms account for the effect of posting infringing content on the authors' incentive to create.

C. Notice and Takedown

Under a notice-and-takedown system, a right holder notifies a platform that a post infringes their rights, and then the platform investigates and decides whether to take the post down. If the platform takes down the alleged infringing material, it avoids liability. If the platform leaves the post up, the right holder then can sue the platform.

In this system, filtering takes two forms: the automated filtering technology of the platform, and takedowns by platforms following notices from right holders. In the following, we consider the incentives of platforms to filter content under such a notice-and-takedown system.

Platforms must investigate every notice at a cost of c_n and take down infringing content. In a way, platforms are the first administrative court before right holders can reach the courts.

The likelihood that a notice is filed (i.e., detection) depends on the amount of posted content:

$$Prob(notice) = p(P_{it}) = p(x_{it} + (1 - f_i)y_{it})$$

i.e., the likelihood that a notice is filed decreases as the accuracy of the filtering technology of the platform increases. Assuming that only valid notices are filed and that they are perfectly ruled on, the Bellman profit equation becomes:

$$\Pi_{it} = r(x_{it} + (1 - p(P_{it}))(1 - f_i)y_{it}) - c_f(f_i, U_{it}) - p(P_{it})c_n + \delta\Pi_{it+1} \quad (2)$$

Platforms compare the cost of filtering to the expected cost of fulfilling a notice. If it is cheaper for platforms to auto-filter than to wait for notices, i.e., if $c_f < p(P_{it})c_n$, the system will incentivize platforms to use filter technology. If the notice system is cheaper, the platforms will wait for right holders to perform their own monitoring. For simplicity, assume that right holders detect all infringements and files accurate notices, i.e., $p(P_{it}) = 1$.

By relying on notices, both platforms and right holders carry some of the costs of infringing material hosted on platforms. This means that platforms externalize some of their cost of doing business onto right holders because platforms do not carry the full cost of monitoring while collecting the benefits of the uploader and user traffic. Whether this is socially optimal from an economic perspective depends on the costs for right holders of filing notices.

Under the notice-and-takedown system, the copyright holder pays the cost c_r of monitoring posted material and filing a notice with the platform. The platform pays the cost c_n of investigating the notice. If $c_f < c_n + c_r$, filtering is the socially optimal way to address infringing uploads: the platform is the least cost avoider. If $c_f > c_n +$

c_r , notice and takedown is the socially optimal way to address infringing uploads: platforms and the right holder combine as the least cost avoider.

Platforms' decision to filter or to follow a notice-and-takedown approach is not socially optimal. Platforms compare their private costs c_f to c_n . If $c_f < c_n$, platforms prefer filtering, whereas if $c_f > c_n$, platforms prefer notice and takedown. The socially efficient method can differ from the privately profit-maximizing approach.

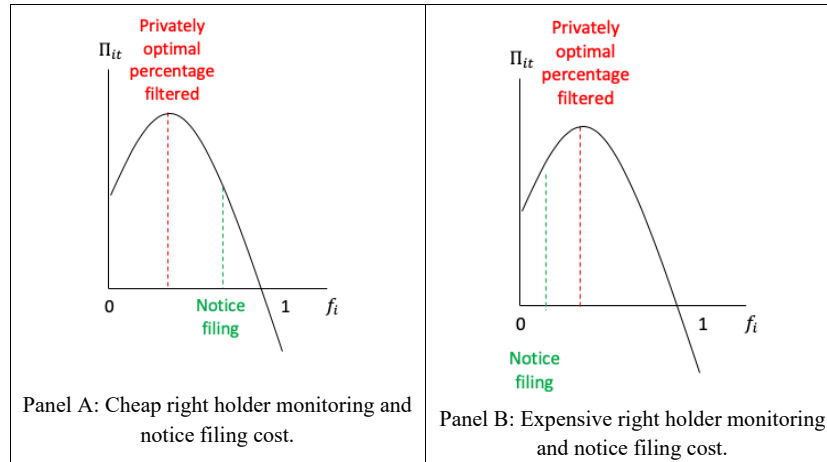


Figure 2: Profit and Monitoring Technology.

Changing perspective, right holders also externalizes some notice-and-takedown costs on platforms. If the monitoring cost is low, right holders can cheaply monitor and file notices. The amount of notices filed could surpass the privately efficient filtering level because right holders would rely on the platforms investigating. If the monitoring cost is high, right holders file fewer notices. The amount of notices could now fall short of the privately efficient filtering level.

These conditions regarding filtering costs (for platforms), takedown costs (for platforms), and monitoring costs (for right holders) lead to four possible scenarios:

1. **Cheap enforcement:** If monitoring is cheap (c_r sufficiently small)¹⁴⁹ and filtering is cheaper than investigating notices ($c_f < c_n$), platforms will filter at the level that they expect right holders to file notices and that they can deduct through backward induction. filter, because they anticipate receiving notices and responding to these is

149. More assumptions need to be made about the threshold value for the right holder cost of monitoring and filing, c_r . The actual value is in relation to the cost of filtering, c_f , is not important to discuss the underlying argument about the relative effect on the privately and socially efficient level of filtering.

more costly than filtering. Platforms may be induced to filter uploads more than privately optimal (Panel A of Figure 2) because it is cheaper to enforce.

2. **Right holder-based enforcement:** If monitoring is cheap (c_r sufficiently small) and filtering is more expensive than investigating notices ($c_f > c_n$), platforms will wait for notices and do not filter. Platforms may be induced to remove more uploads than is privately optimal (Panel A of Figure 2) because it is cheaper to enforce.
3. **Platform-based enforcement:** If monitoring is expensive (c_r sufficiently high) and filtering is cheaper than investigating notices ($c_f < c_n$), platforms will not wait for notices and filter at the privately optimal level (Panel B of Figure 2) because they know that only right holders who value their rights highly will be monitoring.
4. **Expensive enforcement:** If monitoring is expensive (c_r sufficiently high) and filtering is more expensive than investigating notices ($c_f > c_n$), platforms wait for notices, use takedowns and filter the rest to reach the privately efficient level (Panel B of Figure 2). The system allows platforms to either reach their privately efficient level of care by complementing notice with filtering at lower cost because right holders bear the costs of filing notices or platforms may take down more uploads than is privately efficient if the copyright holders file more notices than the platforms would want.

If the filtering was sub-socially optimal, a cheap monitoring system could move the uploaded content toward the socially optimal in cases 1 and 2. In cases 3 and 4, platforms follow their private optimal level of uploading.

The notice system ambiguously affects filtering as compared to no liability filtering levels. The notice system ensures that right holders who value rights more than the cost of monitoring file with the platforms. This system disincentivizes the enforcement (and creation) of low value works. It encourages the dissemination of works with low marginal remaining value (e.g., works whose authors have already profited but whose remaining value is less than the cost of monitoring). Table 2 summarizes the discussion above.

Table 2: Notice and Takedown Summary

	Copyright Holder	Content Distributor

Monitoring	Incentive to monitor but the monitoring cost decreases the incentive to create content.	Some incentive to filter but externalizes some filtering costs onto copyright holders.
Enforcing	No litigation and recoupment option against platforms because of the affirmative defense of notice & takedown.	Platforms can avoid enforcement action through takedowns.

From a dynamic perspective, the liability regime should consider the costs of filtering technology and of notice-and-takedown systems. It should also consider who can improve filtering technology at the lowest costs: platforms or right holders. Platforms have two comparative advantages over right holders: upload notices and economies of scale and scope. First, platforms know when anyone uploads to their system; thus, unlike right holders, they do not need to access another entity's system to monitor for illegal material. Second, developing filtering systems involves high fixed costs while implementing them involves low marginal costs. Platforms can distribute the costs over all uploads hosted on their site. Platforms may also have alternative uses for this technology. For example, platforms can use the filtering technology to match consumers with revenue generating activities (e.g., Apple uses its application Shazam to match consumers with purchasable music on its iTunes platform).¹⁵⁰ These technologies could be deployed to filter content for infringement or to filter content for commercially viable entities.

150. For songs, these technologies have been around for some time. Shazam is a software application that enables the recognition of copyrighted songs. Claire Cain Miller, *Shazam, Maker of Cellphone App, Draws Investment*, N.Y. TIMES (Oct. 15, 2009), <https://www.nytimes.com/2009/10/15/technology/internet/15shazam.html>. Companies like Shazam have monetized the use of the technology. Other companies like Instagram (Facebook) or YouTube already have their own version of this technology. See, e.g., Federic Lardinois, *YouTube Now Tells You How Copyrighted Music Will Affect Your Video Before You Upload It*, TECHCRUNCH (Dec. 8, 2014), <https://techcrunch.com/2014/12/08/youtube-now-tells-you-how-copyrighted-music-will-affect-your-video-before-you-upload-it/?guccounter=1>; Josh Costine, *Instagram Stories Now Lets Its 400M Users Add Soundtracks*, TECHCRUNCH (June 28, 2018), <https://techcrunch.com/2018/06/28/instagram-stories-music/>.

Some platforms have been implementing filtering technology while maintaining a notice-and-takedown system (e.g., YouTube).¹⁵¹ This behavior reveals that for (some) platforms, the notice system costs outweigh the filtering costs: $c_f(f_i, U_{it}) > \rho(P_{it})c_n$.

If platforms wait for notices, and they reveal that administering the notice and takedown system is cheaper than implementing filtering technology, as discussed above, this does not necessarily mean that relying on notices is socially optimal because the platforms do not consider the notification costs of right holders. The possibility of externalizing costs of copyright infringements to right holders thus means that a notice-and-takedown regime may retard innovation in filtering technologies.

D. Strict Liability System

A strict liability system would make platforms liable for hosting infringing material regardless of their filtering efforts. Right holders can go directly to courts without filing a notice with the platform. Right holders can request a takedown (i.e., injunctions) and collect damages for infringement.

The rationale for imposing strict liability on a party is usually to induce that party to take precautions to prevent harm and to potentially reduce the activity altogether. This is considered reasonable for activities that pose a risk of harm to others even when the party acted carefully.

In the case of copyright infringements on platforms, perfectly implemented strict liability ensures that the platforms internalize the cost of their business activities. A strict liability rule thus not only induces platforms to take precautions to prevent harm (by monitoring) but also to consider if they should continue their business model at all given the costs involved. Under the strict liability system, platforms compare filtering costs to the expected costs of infringing material. These infringement costs include the litigation costs and the damages.

The Bellman equation becomes:

$$\Pi_{it} = r(P_{it}) - c_f(f_i, U_{it}) - \rho(P_{it})d_n + \delta\Pi_{it+1} \quad (3)$$

where $\rho(P_{it})$ is the compounding probability that a right holder monitors, litigates, and enforces a claim; and d_n are the damages determined by the court. Comparing profit equation (3) to equation (2), platforms prefer the notice-and-takedown system to strict liability as long as the compensatory damages outweigh the costs of responding to notices.

As the probability $\rho(P_{it})$ approaches one, platforms internalize the cost of their activities and are incentivized to only post the non-infringing content, x_{it} , and filter out the rest. The platform may find

151. Lardinois, *supra* note 150.

it cheaper to filter uploads if the technology is sufficiently cheap and the combined enforcement costs (including monitoring and litigation) are sufficiently high for platforms and low for right holders.

However, since monitoring and enforcement is costly for right holders, $\rho(P_{it})$ is unlikely to be close to one. Right holders need to monitor platforms (c_r) and they need to sue the platforms and pay for the associated costs. These costs to right holders mean that the enforcement probability is likely less than one, which, in turn, means that the platform may prefer to host content and risk litigation. If the filtering technology is expensive, the platform prefers to post everything and wait to be sued.

The incentives of platforms and right holders in monitoring, filtering, and litigating depend on the expectations of a lawsuit. Litigation may be uncertain or imperfect: courts may set the amount of damages imperfectly, or they may err in determining whether content was legal or not.

1. Quantifying Damages

Courts find it difficult to assess compensatory damages in infringement cases that accurately compensate the right holder for the harm done to their ability to profit. If damages vary or are imperfectly set, the incentives of platforms and right holders may be suboptimal. Right holders may request statutory damages in situations where compensatory damages are difficult to prove. Statutory damages may over- and under-compensate right holders; hence, they can over- and under-incentivize content creators.

The incentives of platforms to filter depend on how damages relate to the gains of the platform from hosting the content. If damages are set too low, platforms may end up profiting from infringing postings. Platforms might argue that their marginal costs of an individual post are low—much lower than the potential liability for infringement. However, one could imagine situations in which platforms' marginal profits exceed harm to right holders. For example, the platform may allow users who had no willingness to pay for the copyrighted material to access the material. In such cases, the right holder is not harmed because these users would never have bought the product but the platforms can still monetize the content (e.g., through advertising).

If compensatory damages exceed the gains of platforms, platforms may exit the market because the expected costs of liability are too high. If this is the case, the platforms' business model harmed copyright holders more than it benefited the platforms. The damages imposed on platforms reflect lost profits to copyright holders. Thus, if platforms exit the market in the face of damages, this means that the platforms would not have been able to

compensate the right holder for using his work under a voluntary agreement.

While platforms' business models also create a positive externality for creators, by encouraging content dissemination, disseminating content is not the only aim of the copyright system: dissemination cannot occur without creation. The copyright system needs content creators to profit from this dissemination to incentivize creation. Dissemination of infringing content could benefit society in a static sense but, from a dynamic perspective, it would harm society by discouraging content creators from producing new content.

Strict liability is a net improvement for the copyright system if strict liability enables right holders to profit from that dissemination. Therefore, a platform exiting the market because its business model harms content creators' private incentive would be socially optimal—assuming that all lawsuits are legitimate (an assumption we will revisit below). It could well be, however, that platforms can remain profitable even when compensatory damages exceed their gains. If the enforcement probability $\rho(P_{it})$ is low, in expected terms platforms may still make profits off infringing content.

Instead of compensatory or statutory damages, some courts may opt to disgorge the platforms' gains. Disgorgement of gains from infringing content aims to put the platform in the position prior to the infringement. The platform would have no incentive to post infringing content but it would have no incentive to filter either: it would wait to be sued. In no-harm situations, this unfairly gained damage award would over-compensate and over-incentivize authors to create new copyrightable works.

As compared to no liability, disgorgement damages encourage filtering when cheap and discourage it when expensive as compared to the expected damages. The filtering level would depend on the right holder's costs to acquire those damages. Therefore, even with strict liability, some infringing content is likely to be posted: $P_{it} > x_{it}$.

The level of damages also affects the incentives of right holders. If courts award punitive damages, individual right holders are more likely to sue than when damages are limited to actual harm but they are less likely to obtain such damages. Multiplying compensatory damages can compensate for low incentives to sue due to high enforcement costs for right holders. Such multipliers ensure that the infringers internalize on average the cost of their activities through punitive damages instead of perfect enforcement.

2. Judicial Error

On the one hand, courts may also make mistakes in finding infringement. For example, they may wrongly rule that an uploaded

content did not fall under fair use. If courts wrongly award damages to right holders, they incentivize unmeritorious claims. In this case, platforms might exit the market because of a high expected liability even if they do not host any infringing material.

Strict liability may create a chilling effect if judicial error is considerable. This chilling effect may particularly deter small start-ups because one lawsuit may cost much more than the gains they have generated from their small operations.

On the other hand, courts may wrongly find infringing content to be non-infringing. If courts wrongfully dismiss a claim, they disincentivize future claims. In this case, platforms might proliferate because they fail to internalize the cost of their activities.

3. Ambiguous Effect of Strict Liability

Overall, strict liability has advantages and drawbacks if enforcement is imperfect. With perfect enforcement—and if the platform is the least cost avoider—strict liability ensures that platforms consider all costs of their business model. This incentivizes platforms to adopt the efficient level of care and activity: knowing that they have to cover all costs of liability, platforms will adopt the optimal level of filtering, optimally invest in filtering accuracy, and make a socially optimal decision on whether to continue their business model. The disadvantage is that strict liability may lead to suboptimal levels of care and activity if enforcement is uncertain or imperfect.

As compared to a notice-and-takedown system, a strict liability system may increase takedowns and lawsuits. Right holders have to monitor infringements in either system. Without the defense of takedown-after-notice, platforms may face more lawsuits, but also fewer takedowns would occur. However, under a strict liability system, it may still be cheaper for platforms to keep administering a notice-and-takedown system.

Whether right holders will use this system depends on the costs and rewards of filing a lawsuit. Right holders may bring more suits under the liability system, than file notices under the notice system. Under the notice system, a takedown may follow the notice, but no reward is attached to the notice for past infringement. Under the liability system, the suit allows a right holder to collect damages. Even if a notice is cheaper than a lawsuit, more lawsuits may be filed because the lawsuit cost-benefit outweighs the notice cost-benefit. If, however, it is more attractive for right holders to file notices than to sue for infringement, a strict liability system would resemble a notice-and-takedown system, potentially with more filtering by platforms if filtering is cheaper than waiting for litigation.

On balance, the filtering under the notice system may be greater or lower than under the liability system. The strict liability may even

incentivize platforms to filter beyond the socially efficient level if damages over-estimate the harm and infringement are constantly enforced.

Table 3 summarizes the discussion above.

Table 3: Notice and Takedown Summary

	Copyright Holder	Content Distributor
Monitoring	Incentive to monitor stronger than under Notice & Takedown.	More incentive to filter than under Notice & Takedown.
Enforcing	<p>Litigation and recoupment option against platforms similar to non-digital infringement.</p> <p>Incentive to file unmeritorious claims in case of imperfect enforcement</p>	<p>Platforms cannot avoid liability but may find it more efficient to wait to be sued ex-post than filter ex-ante.</p> <p>Possible chilling effect in case of imperfect enforcement.</p>

E. Negligence System

Given the drawbacks of a strict liability rule, a negligence rule may be superior. Under the negligence rule, platforms are liable if they do not meet certain criteria for monitoring the content they host. The efficiency of such a rule depends on the courts’ (or legislators’) ability to select the socially efficient level of filtering, f_{it}^* .

Under a negligence rule, the platform’s Bellman profit equation becomes:

$$\Pi_{it} = \begin{cases} r(P_{it}) - c_f(f_i, U_{it}) - \rho(P_{it})d_n + \delta\Pi_{it+1}, & \text{if } f_{it} < f_{it}^* \\ r(P_{it}) - c_f(f_i, U_{it}) + \delta\Pi_{it+1}, & \text{if } f_{it} \geq f_{it}^* \end{cases} \tag{4}$$

If perfectly implemented, a negligence rule may incentivize platforms to adopt the efficient level of care in terms of filtering content. Whether platforms optimize both the amount of filtering and the accuracy of filtering depends on how the standard of care is formulated, and on what aspects of filtering courts can verify. Platforms are not induced to optimize the amount of content they

host (or the level of their business activity), given that they can avoid liability by implementing filtering. If the negligence standard is set imperfectly, a negligence rule may thus lead to a suboptimal level or accuracy of filtering but it is unlikely to hamper the business model of online platforms altogether (as may happen under a strict liability rule).

Platforms can provide experts for courts to estimate what is the socially efficient level of filtering; however, this level may change quickly with technology. By the time a court case is heard, the negligence level may well have changed. This constitutes the main downside of a negligence standard in platform liability.

Alternatively, a consortium of independent experts may set the standard more frequently and closely to the socially optimal level than courts. As with any industry standard setting, there are competition concerns regarding coordination among competitors in setting the level of care.¹⁵²

The advantage of a strict liability system to a negligence rule is that it allows platforms to set the level of care themselves. Since platforms likely have a comparative advantage relative to right holders or courts in assessing the efficient level of filtering, this may lead to more efficient outcomes than relying on a court or government body to set this standard. As discussed, the efficiency of such a strict liability to prevent a chilling effect crucially depends on the predictability and accuracy of court rulings.

If the negligence standard is known in advance and platforms abide by the standard, then no infringement suits should arise. A negligence standard would incentivize platforms to be more transparent about their filtering process. If improperly estimated, the rule may lead to more or less than the socially efficient level of filtering. Table 4 summarizes the discussion above.

152. This debate is central to the debate surrounding Standard Developing Organizations.

Table 4: Negligence Rule Summary

	Copyright Holder	Content Distributor
Monitoring	Incentive to monitor under a mixed strategy: without monitoring platforms have no incentive to filter, with monitoring platforms filter sufficiently to avoid liability.	Incentive to filter depends on the enforcement costs and the state of the technology.
Enforcing	Litigation and recoupment option that serves as a threat to induce the platform to filter. Incentive to file unmeritorious claims in case of imperfect enforcement	Platforms can avoid liability by taking due care. If the standard of care is set imperfectly, platforms will follow this standard unless it is set so high that waiting for lawsuits is preferable. Possible chilling effect in case of imperfect enforcement.

F. Imperfect Filtering Technology: False Positives

So far, the model assumes that filtering technology may fail to identify infringing material but always classifies legal material correctly. However, in practice, content filters inevitably results in false positives. A false positive occurs when platforms filter out non-infringing content by mistake.

For simplicity, assume that the filtering technology ϕ_{it} leads to two filter accuracy levels such that $\phi_{it} = \{\alpha_{it}, \beta_{it}\}$ where α_{it} and β_{it} are the accuracy level of filtering for infringing and non-infringing contents respectively.

$$P_{it} = \alpha_{it} x_{it} + (1 - \beta_{it})y_{it}.$$

As α_{it} or β_{it} approaches 1, the filter becomes more accurate and fewer content is mistakenly filtered. If both types of content are perfectly filtered (i.e., $\alpha_{it} = 1$ and $\beta_{it} = 1$), then only the non-infringing content is posted (i.e., $P_{it} = x_{it}$). If no filter is implemented (i.e., $\alpha_{it} = 1$ and $\beta_{it} = 0$), then $P_{it} = U_{it}$. If both types of content are imperfectly filtered (i.e., $\alpha_{it} < 1$ and $\beta_{it} < 1$), then the filter system successfully eliminates the β_{it} portion of infringing content but falsely eliminates $(1 - \alpha_{it})$ portion of the non-infringing content.

False positives (i.e., filtered non-infringing content) create inefficiencies. If an author knows that his work will be incorrectly filtered, then that author may not bother with creating content. False negatives (i.e., non-filtered infringing content) create similar inefficiencies. If an author knows that his work will be infringed and incorrectly uploaded, then that author may not bother with creating content. Only as long as an author expects the filtering accuracy to be sufficiently high, that author may still find it privately profitable to make new works.

Imperfect filtering technology and associated false positives also affects the efficiency of the various liability rules. If a platform cannot ensure full accuracy of its filtering technology, a liability rule may induce the platform to over-block content. The reason is that false negatives may be more costly to platforms than false positives, if damages outweigh the profits from an individual post. Shifting from a notice-and-takedown system to a negligence rule or a strict liability rule may thus lead to more over-blocking if filtering technology is imperfect.

Nevertheless, the accuracy of filtering technology is unlikely to be improved over time. Platforms may be able to invest in the development of filtering technology to improve its accuracy. However, if a notice-and-takedown system is in place, and maintaining it is relatively cheap, platforms may not make these investments to improve filtering.

V. CONCLUSION

During the last few decades, the internet has transformed society, expanding the content we can view and enabling entire new genres of communication and expression. It also has had major consequences for the world of copyright, allowing anonymous users to create unlimited copies of digital content at no cost. As a result, right holders have strived to combat infringements. In this fight, they have targeted not only users sharing protected content, but also the platforms that make it possible to share this content.

At the dawn of the internet, policymakers introduced safe harbors for online platforms to balance the protection of copyrighted works with free speech interests, and to allow internet businesses to

grow. The immunity that platforms received made sense when the internet and e-platforms were a nascent idea. Now that the internet industry is on solid footing, we need to consider if these safeguards are still appropriate. Platforms have evolved, changing their business model and their revenue streams, and growing exponentially in size. The balance struck in the DMCA is no longer appropriate today, protecting online platforms more than copyright holders.¹⁵³ It stands to reason that liability rules evolve with the changed circumstances.¹⁵⁴

In the debate on platform liability, right holders contend that online platforms should do more to prevent copyright infringement, whereas platforms see the safe harbors as essential to online free speech and as a fair distribution of responsibilities for enforcing copyrights.

The aim of this article was to explore the responsibilities of right holders and platforms, from an economic perspective. According to the least cost avoider principle, liability should be assigned to the party that can avoid costs of harm at the lowest cost. Online platforms are typically the least cost avoider for copyright infringements, given that they benefit from traffic on their sites, govern the platform where infringing content is hosted and can identify or remove infringers and remove the content. One can view online copyright infringements as a negative externality caused by the business model of online platforms. Because online platforms provide the environment for copyright infringements and profit from these infringements, it is efficient for them to carry these costs of doing business.

In this article, we considered which liability rule would be preferable, in light of the incentives of platforms, right holders and creators under different liability regimes. Under a command-and-control approach, the government would prescribe filtering technology. A market-based approach, such as by implementing a liability rule, would leave platforms more freedom to choose the level of filtering. Given that platforms are likely to be better informed about the costs of filtering, this would be the efficient alternative.

Comparing strict liability with a negligence rule, we need to balance the ability of lawmakers to set the optimal standard of care against the ability of courts to accurately rule on copyright claims. A strict liability rule encourages online platforms to determine the optimal level of filtering as well as the value of their business activity, in relation to its costs. This ensures that platforms internalize all costs associated with their business model, but could create chilling effects if courts make errors and wrongly assign liability. Legal error may lead right holders to file unmeritorious suits, which could hamper

153. Harris, *supra* note 2, at 804.

154. *Id.* at 806.

the development of beneficial online business models. A negligence rule can overcome this problem, provided that courts can correctly determine due care. In practice, such a standard of care may lag behind technology, especially given that filtering technology is constantly evolving. We consider policy solutions for a negligence rule that is flexible enough to account for the rapid changes in filtering technology.

Moreover, a negligence rule would have to be formulated such that courts can accurately verify if platforms took due care. Describing to courts how the technology filters content could raise more issues than help accurately determine the standard of care. However, the accuracy of the system could be illustrated using descriptive statistics. For example, under a negligence rule, courts could look at the rate of complaints per post and compare it to the industry standard. Under a negligence rule paired with a notice-and-takedown system, courts may also look at the rate of notices per posts and compare it to the industry standard. This outcome-based standard could reveal the most efficient of the precautionary measures.

Such a principle-based negligence rule could be introduced in the current liability regime in several ways. One possible solution would be to amend platform liability in general. A subtle way to do this would be to keep the Section 230 distributor immunity intact but condition it on an online platform taking reasonable steps to remove unlawful user-generated content of which it is aware.¹⁵⁵ Limiting the application of Section 230 to Good Samaritans, understood as online platforms that take reasonable steps to remove illegal content when warned, would be consistent with the original purpose of Section 230.¹⁵⁶ Section 230 was never meant to support online platforms that provide a public square with no moderation or that even knowingly solicit illegal activity.¹⁵⁷

Alternatively, platforms' obligations could be increased with respect to copyright infringements specifically. One possible solution is to impose liability against online platforms outside the DMCA's safe harbor provisions. Harris proposes a duty-based regime requiring online platforms to take reasonable efforts to prevent infringements.¹⁵⁸ These efforts should at least include monitoring their sites using filtering technology to detect and prevent infringement.

In a similar vein, Helman and Parchomovsky advocate imposing a monitoring duty on online platforms, requiring them to use the "best technology available" to monitor and filter infringing

155. See Citron & Wittes, *supra* note 10, at 467.

156. *Id.* at 468–69.

157. *Id.*

158. Harris, *supra* note 2.

material.¹⁵⁹ Another proposal is an opt-in regime administered by the U.S. Copyright Office, who then would provide a filtering and monitoring system that would compare user content to a copyright database.¹⁶⁰

Harris proposes to include a reasonableness standard that imposes a different burden on small platforms than larger ones.¹⁶¹ This should help address the concern that additional obligations on platforms could place a disproportionate burden on small players, effectively cementing market leaders in their positions.¹⁶²

Regardless of the alternative chosen, the challenge will be to ensure that the standard of care corresponds to industry practice and stays up to date, while avoiding chilling effects on beneficial online business models. Nevertheless, increasing platform liability appears necessary to reduce copyright infringements online today and to incentivize platforms to invest in better filtering technology to reduce infringements in the future. Policymakers should seek to encourage technological development, creating rules or standards that anticipate and contribute to improved filtering technology.

159. Lital Helman & Gideon Parchomovsky, *The Best Available Technology Standard*, 111 COLUM. L. REV. 1194, 1207 (2011).

160. Bryan E. Arsham, *Monetizing Infringement: A New Legal Regime for Hosts of User-Generated Content*, 101 GEO. L.J. 775, 792 (2013).

161. Harris, *supra* note 2.

162. *See, e.g.*, Urban et al., *supra* note 68, at 516.