

SAFE HARBORS AND THE EVOLUTION OF ONLINE PLATFORM MARKETS: AN ECONOMIC ANALYSIS[♦]

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ABSTRACT

When a pirated version of a copyrighted work is shared over the Internet, many online intermediaries may participate, exposing these firms to liability through legal concepts such as direct, contributory and vicarious infringement. Safe harbors largely shield intermediaries from “crippling liability” in return for cooperative action on infringing materials. Yet, digital piracy remains a problem. In this paper, we offer a simple economic model of safe harbor protection, demonstrating that de minimis liability for these platforms promotes infringing platforms to the detriment of responsible ones. Increasing the risk of liability for infringement results in a “separating equilibrium,” with one platform offering only legitimate and high-value content and another offering a combination of illegitimate and low-value content. Effective platform liability should ultimately change the structure of the platform industry, which we believe should improve enforcement of copyright law. Legal changes similar to those prescribed here were recently been proposed in the European Union.

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INTRODUCTION

When a pirated version of a copyrighted work (or other objectionable or illegal content) is shared over the Internet, many online intermediaries may participate, including the broadband companies that provide the connections, the search services that facilitate finding the material, the owners of the servers that store the infringing files, and the software and technology companies whose platforms effectuate the transfer. The intermediaries' role in the infringing or illegal acts may expose these firms to liability through legal concepts such as direct, contributory and vicarious infringement.¹ The U.S. Congress, faced with an "epidemic" of digital piracy yet concerned about "crippling liability" on the growth of the Internet, crafted as a solution the safe harbor provisions of the 1998 Digital Millennium Copyright Act ("DMCA").² Conditions and limitations of the safe harbor outlined in section 512 of the DMCA aimed to balance "the interests of the owners of copyrighted works with those who use or facilitate the use of those works in the digital age."³

History demonstrates the safe harbors have created an environment well-suited for the rapid growth of user-uploaded content ("UUC") platforms, producing Internet institutions like Google, YouTube, Twitter, and Facebook, among others. Yet, while Congress intended to craft a "legal framework to ensure [rights-holders] can protect their

¹ See, e.g., S. REP. NO. 105-90, at 8 (1998) [hereinafter SENATE REPORT] ("In the ordinary course of their operations service providers must engage in all kinds of acts that expose them to potential copyright infringement liability."); Robert P. Latham, Carl C. Butzer & Jeremy T. Brown, *Legal Implications of User-Generated Content: YouTube, MySpace, Facebook*, 20 INTELL. PROP. & TECH. L. J. 1 (2008); Jane C. Ginsburg, *User-Generated Content Sites and Section 512 of the US Copyright Act*, in COPYRIGHT ENFORCEMENT & THE INTERNET 183 (Irina A. Stamatoudi ed., 2010); Douglas Lichtman & William Landes, *Indirect Liability for Copyright Infringement: An Economic Perspective*, 16 HARV. J. L. & TECH. 395 (2003); Kylie Pappalardo, *Duty and Control in Intermediary Copyright Liability: An Australian Perspective*, 4 IP THEORY 9 (2014); Cheng Lim Saw & Warren B. Chik, *Revisiting Authorisation Liability in Copyright Law*, 24 SING. ACAD. L.J. 698 (2012).

² 17 U.S.C. § 512 (2012); see also 144 CONG. REC. S11887, S11888 (daily ed. Oct. 2, 1998) [hereinafter SENATE CONFERENCE REPORT].

³ SENATE CONFERENCE REPORT, *supra* note 2, at S11889. Section 230 of the Communications Decency Act of 1996 ("CDA") does the same for illegal activity unrelated to intellectual property, though its limitations on liability are much broader. See 47 U.S.C. § 230 (2012).

work from piracy,”⁴ digital piracy remains rampant on UUC platforms.⁵ In light of these facts, in 2015, the U.S. Copyright Office initiated a review of section 512.⁶ Likewise, reforms to the safe harbors of the Communications Decency Act of 1996 (“CDA”), which also have failed to sufficiently curtail illegal communications, have been proposed.⁷ The embedded imbalances in the U.S. system warrant study both for improving U.S. law and aiding the reform of copyright law in other nations.

With that in mind, we offer in this Article a simple economic model that reveals how the limited liability afforded by safe harbor protection of UUC platforms affects the evolution of these platforms. Our model demonstrates that de minimus liability for these platforms promotes the success of platforms with high shares of infringing material to the detriment of platforms that properly vet uploaded files for illegal materials using the increasingly effective content identification systems.⁸ That is, vetting is costly, putting responsible platforms at a disadvantage in a competitive platform market.⁹ Increasing the risk of liability on UUC platforms that host infringing (or otherwise illegal) material, while offering safe harbor to those that vet

⁴ H. REP. NO. 105-551, pt. 2, at 23 (1998) [hereinafter HOUSE REPORT].

⁵ See, e.g., DAVID N. BARNETT, BRAND PROTECTION IN THE ONLINE WORLD: A COMPREHENSIVE GUIDE (2017); *Shadow Market: 2011 BSA Global Software Piracy Study*, BSA (9th ed. 2012), http://globalstudy.bsa.org/2011/downloads/study_pdf/2011_BSA_Piracy_Study-Standard.pdf; Valerie Peterson, *Digital Piracy Issues and Protecting Intellectual Property*, THE BALANCE (Oct. 17, 2016), <https://www.thebalance.com/digital-piracy-intellectual-property-2800200>; Patrick Kehoe, *Why Is Digital Piracy Running Rampant, and What Can We Do About It?*, SECURITYINTELLIGENCE (July 9, 2015), <https://securityintelligence.com/why-is-digital-piracy-running-rampant-and-what-can-we-do-about-it>; Zack Whittaker, *70 percent find software piracy ‘socially acceptable’*, ZDNET (Mar. 2, 2011, 2:34 AM), <http://www.zdnet.com/article/70-percent-find-software-piracy-socially-acceptable>; Chris Ruen, *Bored With Hollywood Blockbusters? Blame Digital Piracy.*, NEW REPUBLIC (July 25, 2014), <https://newrepublic.com/article/118858/digital-piracy-ruining-pop-culture>.

⁶ Section 512 Study: Notice and Request for Public Comment, 80 Fed. Reg. 81862 (Dec. 31, 2015).

⁷ See, e.g., Vanessa Bouché, *A Report on the Use of Technology to Recruit, Groom and Sell Domestic Minor Sex Trafficking Victims*, THORN (Jan. 2015), https://271511qnwey246mkc1vzqg0-wpengine.netdna-ssl.com/wp-content/uploads/2015/02/Survivor_Survey_r5.pdf; Robbie Couch, *70 Percent Of Child Sex Trafficking Victims Are Sold Online: Study*, HUFFINGTON POST (July 25, 2014, 6:50 PM), http://www.huffingtonpost.com/2014/07/25/sex-trafficking-in-the-us_n_5621481.html; Sarah Jeong, *A new bill to fight sex trafficking would destroy a core pillar of internet freedom*, THE VERGE (Aug. 1, 2017, 10:30 AM), <https://www.theverge.com/2017/8/1/16072680/cda-230-stop-enabling-sex-traffickers-act-liability-shield-senate-backpage>.

⁸ See, e.g., *Audible Magic’s Content ID*, AUDIBLE MAGIC, <https://www.audiblemagic.com> (showcasing the content identification product available from Audible Magic Content ID) (last visited Feb. 1, 2018).

⁹ Lefort analyzes a similar problem when rights-holders compete directly in the platform market with intermediaries offering infringing copies of the works. A differentiated equilibrium emerges, where the intermediary offering illegal content hosts lower quality goods. See Marine Lefort, *Copyright Enforcement and Quality Differentiation on the Internet*, 10 REV. ECON. RES. ON COPYRIGHT ISSUES 27 (2013).

the uploads of their users, results in a “separating equilibrium,” where two types of these platforms arise—one offering only (or mostly) legitimate content, and another offering a combination of illegitimate and *low value* content. Thus, the introduction of effective platform liability should ultimately change the structure of the platform industry by allowing legitimate platforms that vet their content to thrive.

In turn, this separating equilibrium aids copyright enforcement, especially with respect to site blocking, which is sometimes claimed to have a “wide net” problem.¹⁰ By separating the platform wheat from the chaff, so to speak, better safe harbor policies not only make the legitimate site business model feasible, but also provide the opportunity for more effective and less controversial site blocking by providing a “clear shot” at mostly infringing platforms, reducing the social cost of unintended sanction.¹¹

I. BACKGROUND

As a compromise intended to protect copyright holders from digital piracy while also protecting “passive” online intermediaries from an avalanche of lawsuits resulting from the infringing uploads of their users, section 512 of the 1998 Digital Millennium Copyright Act (“DMCA”) established a “safe harbor” for online intermediaries.¹² In

¹⁰ The concern applies not only to site-blocking but to other blocking and filtering technologies. See, e.g., Center for Rights & Fight for the Future, *PROTECT IP / SOPA Breaks the Internet*, VIMEO (2011), <https://vimeo.com/31100268>; *Freedom of Expression Unfiltered: How blocking and filtering affect free speech*, ARTICLE 19 (Dec. 2016), https://www.article19.org/data/files/medialibrary/38586/Blocking_and_filtering_final.pdf; Matthew Ingram, *When do Twitter block lists start infringing on free speech?*, FORTUNE (June 12, 2015), <http://fortune.com/2015/06/12/twitter-free-speech/>; Andrew K. Pace, *Lemonade from Lemons*, AM. LIBR. MAG. (Jan. 2005), <https://americanlibrariesmagazine.org/lemonade-from-lemons/>; Josh Taylor, *Bad piracy legislation leaves rights holders lost at sea*, CRIKEY (June 27, 2016), <https://www.crikey.com.au/2016/06/27/bad-piracy-legislation-confuses-courts/>; Hannah Francis, *Fears thousands of legitimate websites could be blocked under anti-piracy, site-blocking regime*, SYDNEY MORNING HERALD (Apr. 21, 2015), <http://www.smh.com.au/digital-life/digital-life-news/fears-thousands-of-legitimate-websites-could-be-blocked-under-antipiracy-siteblocking-regime-20150421-1mpy0r.html>; Ernesto Van der Sar, *UK ‘Porn Filter’ Blocks Legitimate File-Sharing Services (And TorrentFreak)*, TORRENTFREAK (Jan. 3, 2014), <https://torrentfreak.com/uk-porn-filter-blocks-legitimate-file-sharing-services-and-torrentfreak-140103>.

¹¹ Defendants may use a mix of infringing and legitimate content as a shield against liability. See, e.g., *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 442 (1984) (“the sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes. Indeed, it need merely be capable of substantial noninfringing uses.”); *Metro-Goldwyn-Mayer Studios, Inc. v. Grokster, Ltd.*, 545 U.S. 913, 918–19 (2005) (considering “under what circumstances the distributor of a product capable of both lawful and unlawful use is liable for acts of copyright infringement by third parties.”).

¹² 17 U.S.C. § 512; see also *ALS Scan, Inc. v. RemarQ Cmty., Inc.*, 239 F.3d 619, 625 (4th Cir. 2001) (citing H REP. NO. 105-786 at 72 (1998) (Conf. Rep.)) (“The DMCA was enacted both to preserve copyright enforcement on the Internet and to provide immunity to service providers from copyright infringement liability for ‘passive,’ ‘automatic’ actions in which a service provider’s

the United States, the safe harbor status covers many different types of Internet intermediary services, including: (a) transitory digital network communications (e.g., ISPs); (b) system caching (e.g., the temporary storage of web content to improve search and download efficiency); (c) information residing on systems or networks at the direction of users (e.g., YouTube, chat rooms, personal websites); and (d) information local tools (e.g., search engines).¹³

For these online intermediaries, the safe harbor is “not presumptive, but granted only to ‘innocent’ service providers”¹⁴ Among other things, to enjoy the safe harbor, online intermediaries must be highly passive in nature, meaning that they: (a) *must not* have actual knowledge that the material is infringing; (b) *must not* be aware of the facts or circumstances in which infringing activity is apparent (“red flag” knowledge); (c) *must not* engage in “willful blindness” of infringing activity; (d) *must not* interfere with standard technological measures used by copyright owners to identify or protect copyrighted works; and, perhaps, more critically, (e) *must not* receive financial benefit directly attributable to the infringing activity.¹⁵ Intermediaries must also have “reasonably implemented” policies for addressing “repeat infringers.”¹⁶ For certain online intermediaries, including UUC platforms, sections 512(b)–(d) require the intermediaries to expeditiously address an infringement upon notification that it is facilitating the distribution of infringing material. These procedures are commonly referred to as the “notice-and-takedown” provisions of the DMCA.¹⁷

Since the passage of the DMCA, the Internet has flourished. At the

system engages through a technological process initiated by another without the knowledge of the service provider.”); HOUSE REPORT, *supra* note 4, at 11; BRIAN T. YEH, CONG. RESEARCH SERV., R43436, SAFE HARBOR FOR ONLINE SERVICE PROVIDERS UNDER SECTION 512(C) OF THE DIGITAL MILLENNIUM COPYRIGHT ACT (2014); SENATE REPORT, *supra* note 1, at 65 (Such legislation was enacted “to ensure that the appropriate copyright protections are in place around the world and to foster the enormous growth of the Internet and other digital computer networks.”); JESSICA LITMAN, DIGITAL COPYRIGHT (2006).

¹³ 17 U.S.C. §§ 512 (a)–(d) (2012).

¹⁴ *ALS Scan*, 239 F.3d at 625; *see also* Capitol Records, Inc. v. MP3tunes, LLC, 821 F.Supp.2d 627, 638 (S.D.N.Y. 2011) (“The DMCA’s safe harbors, as with all immunities from liability should be narrowly construed.”).

¹⁵ *See* 17 U.S.C. § 512(c)(1)(B) (2012).

¹⁶ *See* 17 U.S.C. § 512(i)(1)(A) (2012).

¹⁷ 17 U.S.C. § 512 (2012). Explanations of section 512 are bountiful. *See, e.g.*, Ginsburg, *supra* note 1; Jennifer M. Urban & Laura Quilter, *Efficient Process or Chilling Effect—Takedown Notices under Section 512 of the Digital Millennium Copyright Act*, 22 SANTA CLARA HIGH TECH. L.J. 621 (2006); Daniel Seng, *The State of the Discordant Union: An Empirical Analysis of DMCA Takedown Notices*, 18 VA. L. J. OF L. & TECH. 369 (2014); Alfred C. Yen, *Internet Service Provider Liability for Subscriber Copyright Infringement, Enterprise Liability, and the First Amendment*, 88 GEO. L. J. 1 (2000); Miquel Peguera, *The DMCA Safe Harbors and Their European Counterparts: A Comparative Analysis of Some Common Problems*, 32 COLUM. J. L. & ARTS 481 (2009).

end of 1998, there were 147 million Internet users worldwide, while today there are four billion, or half the world's population.¹⁸ In the United States, Internet adoption has risen from 160 million in 2000 to 270 million in 2015,¹⁹ and the world has witnessed the rise of corporate giants such as Google, eBay, Amazon, Alibaba, Baidu, Twitter, Netflix, and Facebook, among others.²⁰ With respect to section 512's objective to "foster the enormous growth of the Internet," recent history is extremely favorable.²¹

With regard to protecting intellectual property rights, however, section 512 has failed to reduce digital piracy to manageable levels. Over the years spanning from 2000 through 2015, as Internet adoption rapidly grew, U.S. sales of recorded music fell 65% in real terms, a devastating decline attributable in no small part to digital piracy.²² According to Google's *Transparency Report*, in 2016 the company received nearly three million takedown requests *per day* for its search engine alone.²³ Notice-and-takedown has proven little more than a game of Whack-A-Mole for rights-holders, where removed content is often quickly replaced with new infringing files.²⁴ Site-blocking and other legal actions against the worst infringing platforms has helped curb digital piracy, but some rebalancing work seems called for to address

¹⁸ *Internet Growth Statistics*, INTERNET WORLD STATS, <http://www.internetworldstats.com/emarketing.htm> (last visited Feb. 1, 2018); *World Internet Users and 2017 Populations Stats*, INTERNET WORLD STATS (June 30, 2017), <http://www.Internetworldstats.com/stats.htm>.

¹⁹ Andrew Perrin & Maeve Duggan, *Americans' Internet Access: 2000-2015*, PEW RES. CTR.: INTERNET & TECH. (June 26, 2015), <http://www.pewInternet.org/2015/06/26/americans-Internet-access-2000-2015>; United States Census Bureau, *National Population Totals Tables: 2010-2017*, <https://www.census.gov/data/tables/2017/demo/popest/nation-total.html> (last visited Nov. 17, 2017).

²⁰ *The 25 Largest Internet Companies in the World*, WORLDATLAS.COM (Feb. 13, 2017), <http://www.worldatlas.com/articles/the-25-largest-internet-companies-in-the-world.html>.

²¹ SENATE CONFERENCE REPORT, *supra* note 2, at S11891.

²² *U.S. Sales Database*, RIAA, <https://www.riaa.com/u-s-sales-database/> (last visited Feb. 2018).

²³ *Transparency Report: Copyright and Google Search*, GOOGLE, <https://www.google.com/transparencyreport/removals/copyright/?hl=en> (last visited July 24, 2017).

²⁴ Whack-A-Mole is "[a]n arcade game in which players use a mallet to hit toy moles, which appear at random, back into their holes." *whack-a-mole*, ENGLISH OXFORD LIVING DICTIONARIES, <https://en.oxforddictionaries.com/definition/us/whack-a-mole> (last visited Nov. 17, 2017). See, e.g., Devin Hartline, *Endless Whack-A-Mole: Why Notice-and-Staydown Just Makes Sense*, CTR. FOR PROTECTION INTELL. PROP. (Jan. 14, 2016), <https://cpip.gmu.edu/2016/01/14/endless-whack-a-mole-why-notice-and-staydown-just-makes-sense>; *Structural Infringers: How to Protect Copyright Without Stifling Innovation*, INT'L PUBLISHERS ASS'N (June 30, 2016), <https://www.internationalpublishers.org/copyright/copyright-news/409-structural-infringers-how-to-protect-copyright-without-stifling-innovation> ("Publishers and other content owners broadly criticize the legislation as being out of date and ineffectual, since unauthorized copies of their material frequently continue to resurface online, despite sometimes hundreds of thousands of take-down notices.").

the persistence of digital piracy under the privilege of safe harbor.²⁵ Despite the extensive availability of legal online services distributing creative works, section 512 has largely failed to protect owners of both large and small portfolios of creative property.

Recent technological and legislative developments offer some hope for improvement. A number of nations have passed site-blocking laws, thereby easing enforcement actions against the most egregious sources of infringing materials. Evidence suggests site-blocking has proven to be an effective tool for reducing digital piracy.²⁶ Also, frustrated by notice-and-takedown's effect on the user experience and fearing the loss of safe harbors by directly benefitting financially from infringing materials (by section 512(c)(1)(B)), many larger UUC platforms have incurred the cost of implementing content vetting algorithms to detect infringing materials.²⁷ YouTube designed its own system (Content ID), as have others, but there are also third-party solutions available like Audible Magic.²⁸ YouTube claims it is now able

²⁵ See, e.g., Brett Danaher, Michael D. Smith & Rahul Telang, *Website Blocking Revisited: The Effect of the UK November 2014 Blocks on Consumer Behavior* (Carnegie Mellon Univ. Initiative for Dig. Entm't Analytics, Working Paper, 2016), <http://ssrn.com/abstract=2766795>; *Site blocking efficacy in Portugal: September 2015 to October 2016*, INCOPRO (May 2017), <http://www.incoproip.com/wp-content/uploads/2017/07/Site-Blocking-and-Piracy-Landscape-in-Portugal-FINAL.pdf>; *Site blocking efficacy study: United Kingdom*, INCOPRO (Nov. 13, 2014), http://auscreenassociation.film/uploads/reports/Incopro_Site_Blocking_Efficacy_Study-UK.pdf; Mike Ellis, *Progress Against Piracy: MPA finds Asia-Pacific allies in copyright-infringement fight*, FILM J. INT'L (Nov. 28, 2016), <http://www.filmjournal.com/features/progress-against-piracy-mpa-finds-asia-pacific-allies-copyright-infringement-fight>; *Site Blocking in the World*, MPA (Oct. 2015), <http://www.mpa-i.org/wp-content/uploads/2016/02/Site-Blocking-October-2015.pdf>; Nigel Cory, *How Website Blocking is Curbing Digital Piracy Without "Breaking the Internet"*, INFO. TECH. & INNOVATION FOUND. (Aug. 2016), <http://www2.itif.org/2016-website-blocking.pdf>.

²⁶ See, e.g., Danaher, Smith & Telang, *supra* note 25; *Site blocking efficacy in Portugal: September 2015 to October 2016*, *supra* note 25; *Site blocking efficacy study: United Kingdom*, *supra* note 25; Ellis, *supra* note 25; *Site Blocking in the World*, *supra* note 25; Cory, *supra* note 25.

²⁷ Content ID arose from litigation between Viacom and Google. See Jonathan Stempel, *Google, Viacom settle landmark YouTube lawsuit*, REUTERS (Mar. 18, 2014, 9:05 AM), <http://www.reuters.com/article/us-google-viacom-lawsuit-idUSBREA2H11220140318>.

²⁸ See Benjamin Boroughf, *The Next Great YouTube: Improving Content ID to Foster Creativity, Cooperation, and Fair Compensation*, 25 ALB. L.J. SCI. & TECH. 95 (2015); Geoff Weiss, *As Facebook Video Swells, YouTube Creators Cry Foul Over Copyright Infringement*, ENTREPRENEUR (June 5, 2015), <https://www.entrepreneur.com/article/247047>; Amanda Ernst, *YouTube, Google Face Class Action Infringement Suit*, LAW360 (May 4, 2007), <https://www.law360.com/articles/24119/youtube-google-face-class-action-infringement-suit>; Christina Warren, *How YouTube Fights Copyright Infringement*, MASHABLE (Feb. 17, 2012), <http://mashable.com/2012/02/17/youtube-content-id-faq/#WdSxivXkJ5qZ>; Maya Kosoff, *Facebook is rolling out a solution to its 'freebooting' problem*, BUS. INSIDER (Aug. 27, 2015, 2:38 PM), <http://www.businessinsider.com/facebook-rolling-out-solution-to-its-freebooting-problem-2015-8>; Rob Price, *Facebook's new video business is awash with copyright infringement and celebrities are some of the biggest offenders*, BUS. INSIDER (May 6, 2015, 8:14 AM), <http://www.businessinsider.com/facebook-copyright-infringement-facebook-content-id-celebrities-2015-5?r=UK&IR=T>; Neha Alawadhi, *ContentID is Google's code against piracy*, ECON. TIMES (Aug. 4, 2016, 5:19 PM),

to detect 99.5% of infringing materials (which may still result in millions of infringing acts), though the effectiveness of the system is contested.²⁹ Even if imperfect, these content vetting technologies demonstrate that UUC platforms are capable of vetting content, and thus, these platforms can no longer claim they are helpless with respect to the infringing activities of their users. This important development in the UUC platform market plays a key role in our analysis.

These vetting systems also shed light on the proper role of notice-and-takedown procedures. Notice-and-takedown has proven ineffective as a front-line defense against digital piracy. Instead, with content identification technologies, notice-and-takedown seems better suited as a backstop effort for the few instances where infringing material escapes detection. In modern times, it seems reasonable that a formal vetting system, mechanical or manual, should be a predicate for safe harbor. Also, we believe modifying section 512(c)(1)(B)'s "financial benefit" language to more clearly limit the application of safe harbors to plainly "passive" rather than "active" business plans of online intermediaries may nudge the UUC platforms to act more responsibly.³⁰ Modifications along these lines are already under consideration in the European Union. Article 13 and 14 of the *Digital Single Market Directive Proposal* ("*Directive Proposal*") requires online intermediaries to "prevent the availability" of infringing works with measures "such as

<http://economictimes.indiatimes.com/tech/internet/ContentID-is-googles-code-against-piracy/articleshow/53533936.cms>; Saba Hamedy, *YouTube has paid \$2 billion to rights holders through Content ID*, MASHABLE (July 13, 2016), <http://mashable.com/2016/07/13/youtube-content-id-piracy-update/#e2FpNVjLjSqt>; Ellen Seidler, *YouTube's Content ID Easily Fooled*, VOX INDIE (June 30, 2016), <http://voxindie.org/youtubes-content-id-easily-fooled>; Todd Spangler, *YouTube: Music Biz Generates Half Its Revenue on the Site From Copyright-Identification System*, VARIETY (July 13, 2016, 3:01 AM), <http://variety.com/2016/digital/news/youtube-music-copyright-content-id-1201813307>; Dan Rys, *Facebook Developing Copyright ID System to Stem Music Rights Infringement*, BILLBOARD (Dec. 28, 2016), <http://www.billboard.com/articles/business/7639969/facebook-developing-copyright-id-system-music-rights-infringement>; David Noël, *Q&A: Our New Content Identification Systems*, SOUNDCLOUD BLOG (Jan. 5, 2011), <https://blog.soundcloud.com/2011/01/05/q-and-a-content-identification-system>; *Copyright Compliance Service: Compliance Automation for Media Sharing Platforms*, AUDIBLE MAGIC, <https://www.audiblemagic.com/compliance-service> (last visited July 18, 2017); Andrew Flanagan, *Vimeo to Launch Music Copyright ID System (Exclusive)*, BILLBOARD: BILLBOARDBIZ (May 21, 2014, 10:00 AM), <http://www.billboard.com/biz/articles/news/digital-and-mobile/6092241/vimeo-to-launch-music-copyright-id-system-exclusive>.

²⁹ Paul Resnikoff, *99.5% of All Infringing Music Videos are Resolved by Content ID*, YouTube Claims, DIGITAL MUSIC NEWS (Aug. 8, 2016), <https://www.digitalmusicnews.com/2016/08/08/copyright-problems-resolved-content-id>; Robert Levine, *'It's a System That Is Rigged Against the Artists': The War Against YouTube*, BILLBOARD (May 5, 2016), <http://www.billboard.com/articles/business/7356794/youtube-criticism-labels-artists-managers-payouts>; Tim Ingham, *'YouTube's Content ID Fails to Spot 20%-40% of Music Recordings'*, MUSIC BUS. WORLDWIDE (July 13, 2016), <https://www.musicbusinessworldwide.com/youtubes-content-id-fails-spot-20-40>.

³⁰ See generally Richard H. Thaler & Cass R. Sunstein, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2008).

the use of effective content recognition technologies.”³¹ Additionally, the *Directive Proposal* more clearly limits the safe harbor to “passive” intermediaries, thereby requiring “active” intermediaries to obtain licenses for copyrighted content. An “active” intermediary is one whose service goes “beyond the mere provision of physical facilities and performing an act of communication to the public” but engages in activity such as “optimising the presentation of the uploaded works or subject-matter or promoting them, irrespective of the nature of the means used therefor.”³² This proposed policy approach remains a proposal and there are details to work out, but these proposed changes to the safe harbor are shown here to have an economic basis and, we suspect, will encourage more responsible behavior by online intermediaries with respect to copyright infringement.

Protecting intellectual property in the digital age is a challenge for policymakers and rights-holders alike, and our analysis is admittedly limited. A variety of Internet intermediaries participate in the distribution of infringing materials.³³ Allocating liability across this ecosystem with the goal of minimizing the cost of reducing infringement by a fixed amount is a complex problem.³⁴ Effectively allocating liability requires evidence of the information available to the intermediary, the mitigation cost of the intermediary, the cost of administering the liability regime, and the net costs of unintended consequences. We do not seek here to solve this difficult problem.

³¹ *Proposal for a Directive of the European Parliament and of the Council on Copyright in the Digital Single Market*, COM (2016) 593 final (Sept. 14, 2016) [hereinafter *Directive Proposal*].

³² *Id.* at 20.

³³ See, e.g., Jacqui Cheng, *BitTorrent census: about 99% of files copyright infringing*, ARSTECHNICA (Jan. 29, 2010, 2:08 PM), <https://arstechnica.com/information-technology/2010/01/bittorrent-census-about-99-of-files-copyright-infringing>; Daniel Sanchez, *The Top 10 Free Music Download and Piracy Sites of 2016...*, DIGITAL MUSIC NEWS (Dec. 22, 2016), <https://www.digitalmusicnews.com/2016/12/22/free-music-download>; Ian Birnbaum, *The state of PC piracy in 2016*, PC GAMER (Aug. 10, 2016), <http://www.pcgamer.com/the-state-of-pc-piracy-in-2016>; Soft-Tech Geeks, *Best Torrents Sites | Top 10 Best Torrents Websites 2017*, YOUTUBE (Apr. 10, 2017), <https://www.youtube.com/watch?v=wM0zY6NSEaE>; Steve Dent, *Music labels sue YouTube ripping site over piracy*, ENGADGET (Sept. 27, 2016), <https://www.engadget.com/2016/09/27/music-labels-sue-youtube-ripping-site-over-piracy>; Alex Castle, *How to download audio from any streaming video*, PCWORLD (Nov. 27, 2014), <http://www.pcwORLD.com/article/2852325/how-to-download-audio-from-any-streaming-video.html>; Lara O'Reilly, *A YouTube video that claims Facebook is 'stealing billions of views' is going viral*, BUS. INSIDER (Nov. 12, 2015, 6:33 AM), <http://www.businessinsider.com/how-facebook-is-stealing-billions-of-views-youtube-video-goes-viral-2015-11?r=UK&IR=T>; Nicole Martinez, *Video Creators are Losing Millions from Facebook Video Posts*, ART L.J. (Sept. 3, 2015), <https://artlawjournal.com/creators-losing-millions-facebook>.

³⁴ See, e.g., ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* (6th ed. 2016), <http://scholarship.law.berkeley.edu/books/2>; Hans-Bernd Schäfer & Andreas Schönenberger, *Strict Liability versus Negligence*, in *ENCYCLOPEDIA OF LAW & ECONOMICS* 596 (Boudewijn Bouckaert & Gerrit De Geest eds., 1999), <http://reference.findlaw.com/lawandeconomics/3100-strict-liability-v-negligence.pdf>; Steven Shavell, *Economic Analysis of Accident Law*, HARV. L. SCH. JOHN M. OLIN CTR. FOR L., ECON. & BUS. DISCUSSION PAPER SERIES 396 (2002); Steven Shavell, *Strict Liability versus Negligence*, 9 J. LEGAL STUD. 1 (1980).

Instead, we rationally limit our attention on what appears to be the primary facilitator of infringement in the modern Internet ecosystem—platforms that host, index, and/or distribute user-uploaded content, no small portion of which is infringing. These platforms include, most obviously, torrent sites, file search platforms, cyber lockers, aggregators, and audio and video-streaming services known for, and often designed for, the illegal indexing and distribution of copyrighted content.³⁵

We do not address in this Article the full implications of safe harbors. For instance, safe harbors may distort the bargains between UUC platforms and rights-holders for licenses, as has been claimed in the “value grab” debate.³⁶ Such distortions may be significant for rights-holder income, both directly and indirectly, by reducing the value of the content to platforms that must obtain rights through normal channels (e.g., Netflix, Google Play, and so forth).³⁷ Such concerns are left to others for future research.

II. AN ECONOMIC MODEL

Our analysis of the effects of safe harbor and similar legal limitations of liability on the structure and performance of the UUC platform market is predicated on several essential facts about this business. Although all economic models are, to varying degrees, significant simplifications of complex issues, it is nevertheless vital that the most important aspects of the problem be retained. To this end, it appears to us that any credible analysis needs to incorporate the following considerations:

- A. Viewers/consumers of online material are largely or completely indifferent to the online material’s legal status;
- B. Verification of the legal status of uploaded works by the hosting platform is costly;
- C. The UUC platform industry is competitive, with profits driven towards competitive returns over time;

³⁵ See, e.g., Paul Resnikoff, *The 100 Biggest Copyright Infringers of All Time (as Ranked by Google)*, DIGITAL MUSIC NEWS (Sept. 8, 2015), <https://www.digitalmusicnews.com/2015/09/08/the-100-biggest-copyright-infringers-of-all-time-as-ranked-by-google>.

³⁶ See, e.g., T. Randolph Beard, George S. Ford & Michael Stern, *Safe Harbors and the Evolution of Music Retailing*, PHOENIX CTR. POL’Y BULL: NO. 41 (Mar. 2017), <http://phoenix-center.org/PolicyBulletin/PCPB41Final.pdf>; Maria Schneider, *Content ID is Still Just Piracy in Disguise*, MUSIC ANSWERS, <http://www.musicanswers.org/content-id> (last visited Feb. 1, 2018).

³⁷ See Beard, Ford & Stern, *supra* note 36; Schneider, *supra* note 36.

- D. Those uploading material, both legal and infringing, select their uploading locations based on the net private benefits they receive from their choices; and
- E. Safe harbor provides a specified liability shield which reduces the probability that a qualifying website is subject to legal sanctions for infringement that disrupts its business.

The reasoning underlying the following core assumptions is straightforward. First, in the great majority of cases, it is practically impossible for a consumer of online content to determine the legal status of viewed material.³⁸ Such determinations are, rather, the province of the uploaders and hosting websites (Assumption A).³⁹ Similarly, observed practice in the uploading marketplace does illustrate that uploader and host vetting of uploaded material is possible. Programs such as Content ID, Audible Magic, and similar measures, which require set-up and operating costs, are imperfect but are improving in their effectiveness in detecting infringing material. Unlike unsupported notice-and-takedown schemes, in which stolen material is often rapidly uploaded again under another account name, pre-upload identification of intellectual property prevents the most egregious abuses (Assumption B).⁴⁰

Such technologies, however, are costly and someone must pay these costs. How these costs are shared between the platform and its users is ultimately determined by the structure of the UUC platform industry and the nature of the market for its services. We assume the long-run profit rates of UUC platforms are driven towards competitive returns over time (Assumption C). This assumption, in turn, implies that

³⁸ Though there are often good clues that the material is infringing, such as the use of rights management information, a retail market for the material, and, often, the name of the site (e.g., piratebay.com).

³⁹ See, e.g., Angela Moscaritolo, *Americans Love Their Pirated Content*, PC MAG, (Jan. 20, 2017, 1:45 PM), <http://www.pcmag.com/news/351185/americans-love-their-pirated-content>; Todd Spengler, *Piracy Survey: 39% of U.S. Consumers Don't Care That Studios Lose Money From Illegal Sharing*, VARIETY (Jan. 18, 2017, 6:00 AM) (citation omitted), <http://variety.com/2017/digital/news/piracy-survey-consumers-studios-lose-money-1201961634> (“74% of U.S. consumers acknowledged that producing or sharing pirated video content is illegal while 69% agreed that streaming or downloading pirated content is illegal.”); Irdeto Global Consumer Piracy Survey: *The Industry's Most Comprehensive Report on this Global Epidemic*, IRDETO (2017), <https://resources.irdeto.com/irdeto-global-consumer-piracy-survey/irdeto-global-consumer-piracy-survey-report>; Amanda Lenhart & Mary Madden, *Music Downloading, File-sharing and Copyright*, PEW RES. CTR. (July 31, 2003), <http://www.pewinternet.org/2003/07/31/music-downloading-file-sharing-and-copyright> (“Two-thirds of those who download music files or share files online say they don't care whether the files are copyrighted or not.”); Adam Dachis, *How You're Breaking the Law Every Day (and What You Can Do About It)*, LIFEHACKER (Feb. 27, 2012, 11:00 AM), <http://lifehacker.com/5888488/how-youre-breaking-the-law-every-day-and-what-you-can-do-about-it>.

⁴⁰ Ingham, *supra* note 29.

users of UUC platforms will, in some form or fashion, bear at least a portion of the costs of any content verification system over time. Thus, we will assume that uploaders using platforms that engage in costly vetting will face higher private costs from uploading there than at alternative platforms that expend no resources reviewing uploads beyond responding ex post to specific takedown requests. Accordingly, inducing uploaders with non-infringing property to upload on any platform engaging in costly vetting of material necessarily involves offering them some offsetting benefit (Assumption D). This is because end users will not favor viewing legal material over infringing content, and the platform must pay for costly policing of their uploaders.

Our most important assumption is Assumption E: safe harbor is a liability shield that reduces or eliminates the threat of legal sanction against the protected platform. To be effective, this sanction must materially impact the platform, thereby creating costs for its owners and, given Assumption C, causing some costs to rebound onto the platform's users. As we will see, for uploaders of non-infringing material to accept the higher costs of uploading on well-vetted platforms, there must exist some countervailing incentive that creates a differential in favor of the legal-only platform. Restricting safe harbor protections to such platforms is one such countervailing incentive.

A. *The Model*

We begin our analysis with a simple description of the universe of potential uploaders of content. Potential uploaders engage with content of two types, "legitimate" and "infringing." Each uploader is assumed to know her own type, and each decides whether or not to upload her material, and where to attempt to upload it. In particular, we posit the existence of a continuum of each type of uploader, with their types uniformly distributed on a finite interval $[a, b]$. Without loss of generality, we take $[a = 0, b = 1]$. The type of a potential uploader we will interpret as the private value or benefit (labeled p), they potentially receive from uploading.

Uploaders can incur costs upfront from uploading their material, and we interpret these as private costs they incur through their efforts in complying with the uploading requirements of a particular website. Websites are taken to be of two sorts, "Open," at which anyone can upload without screening for infringement, and "Vetted," which prevent infringing material by pre-screening uploads. Since only the difference in the incremental uploading costs will matter for our analysis, we normalize the uploader's cost at an Open site to be zero, while attempting to upload at a Vetted site costs $c > 0$. In the interest of simplicity, we assume that Vetted sites enjoy a safe harbor (or safe harbor-like) protection, and are never held legally liable for infringing

uploads, while Open sites face potential liability.⁴¹

We consider first the decisions of potential uploaders of various types. To do this, we introduce the possibility, inherent in the lack of safe harbor protection that an uploader of non-infringing material on an Open site may suffer from legal action taken against the site for infringement. In particular, let p be the type (value) of uploading to a user with *non-infringing* content. If the user uploads on a Vetted site, then her profit or benefit U is:

$$U = p - c \quad (1)$$

As shown in the expression, this cost, c , need not be in the form of a direct financial payment from uploaders for uploading content to a UUC platform. All that is required for a positive c is that the Vetted site reduces the uploader's value of his or her material in some way. For instance, if the UUC platform requires viewers to watch advertisements to cover the costs of vetting, then the value of uploading to the site is reduced, in part, because the ads will reduce consumption.

If, however, she uploads on an Open site, her benefit or profit is:

$$U = (1 - \pi)p \quad (2)$$

where π , $0 < \pi < 1$, represents a loss of expected value or income due to possible sanction of the platform by legal authorities. Thus, π represents the consequences of the lack of safe harbor for the Open platform. If safe harbor protection were very broad and extended to unvetted Open sites, then, for example, $\pi = 0$, while a larger value for π will imply that, for some types p , uploading on the Vetted site may be more privately beneficial. It is perhaps easiest to think of π as the probability the platform is site-blocked so that none of its content is available for viewing. The value to the uploader of her content is that it will be viewed by others, so a large π implies a lower net value to the uploader.

1. Uploading Non-Infringing Works

Uploaders with infringing content are, for simplicity, assumed literally unable to upload on a Vetted site. Thus, their only decisions will concern whether to upload on the Open site, or not at all. We begin by assuming all material, infringing or not, will be uploaded, and move to consider the extensive margin later in the analysis (that is, we assume for now a fixed quantify of content). Setting the extensive margin aside,

⁴¹ In some cases, private contracts may provide a safe harbor-like protection like "DMCA Plus." See, e.g., Annemarie Bridy, *Copyright's Digital Deputies: DMCA-Plus Enforcement by Internet Intermediaries*, in RESEARCH HANDBOOK ON ELECTRONIC COMMERCE LAW 185 (John A. Rothchild, ed., 2016); Matthew Sag, *Internet Safe Harbors and the Transformation of Copyright Law*, 93 NOTRE DAME L. R. (forthcoming 2017), <https://ssrn.com/abstract=2830184>.

the only issue at this stage concerns the behavior of an uploader with non-infringing property. Following Assumption D, we find that a non-infringing uploader of type p will upload on an Open site in preference to a Vetted site if and only if:

$$p - c < (1 - \pi)p \iff p < c/\pi \quad (3)$$

which states that the uploader will choose the platform type offering the largest net benefit. In the presence of both sorts of sites, the fraction $\min\{c/\pi, 1\}$ of legitimate uploaders will upload on the Open site, while the fraction $\max\{1 - (c/\pi), 0\}$ will upload on the Vetted site. Given our assumption that the cost of uploading on an Open site is zero, and that the lowest value of uploading an infringing work is likewise zero, all agents with infringing works would choose to upload on the Open site (and cannot upload to the Vetted site).

There are several things to note about this formulation. First, while all infringing uploaders use Open sites by assumption, some owners of *non-infringing material* may upload on Open sites (see Expression 3). But, this occurs when the value of that non-infringing material is sufficiently small ($p < c/\pi$). Thus, if both site types exist in equilibrium, then the Open sites will exhibit a combination of low-valued, non-infringing material (dancing babies, silly cats, political rants, etc.) while the Vetted sites will host all higher-value legitimate material.

Second, the level of safe harbor enforcement, proxied by π , determines whether Vetted sites could exist at all. Since it is costly to police infringing uploads, and some of these costs inevitably rebound on the uploaders, Open sites enjoy a cost advantage vis-à-vis Vetted sites. As pointed out earlier, viewers of online uploads presumably neither know, nor care, whether particular uploads are infringing or not, so viewers cannot be expected to police infringement. Even for uploaders with legitimate content, compliance with costly vetting procedures is unattractive unless some sufficiently robust offsetting benefit is available. Safe harbor rules, which can in principle disrupt the operations of sites hosting infringing content, *may* provide such an incentive, but only if the penalty for infringement is sufficiently large.

Finally, disruption of Open website operations can impact non-infringing uploaders with material on those sites. However, the amount of such material at risk in this way *does not depend* on the level of enforcement parameter π . This is because the quantity of such non-infringing material is given by (c/π) , so the expected quantity blocked is thus $\pi(c/\pi) = c$, which depends only on the cost differential attributable to vetting uploaded material. Uploading non-infringing works to Open sites is merely uploaders' avoidance of paying for the cost of vetting systems.

2. Uploading Infringing Works

We turn next to the degree of infringing material on Open sites, measured as a percentage of all material on such sites. The percentage of infringing material on Open sites, labeled F , is

$$F = 1/(1 + (c/\pi)) = \pi/(\pi + c) \quad (4)$$

This formula illustrates that F and the level of infringing site disruption π are positively related. That is, the more active the enforcement mechanism, the more *non-infringing* content is uploaded to Vetted sites, thereby increasing the share of infringing material on Open sites. Further, when the uploading cost differential between the Vetted and Open sites, c , is “small,” then even relatively modest values for π will lead to almost complete segregation of material, with non-infringing material being uploaded almost exclusively on Vetted sites, and Open sites hosting almost solely infringing files. Here, it is easy to see that a more aggressive enforcement regime creates better targets for site-blocking and other enforcement actions. If enforcement is strong enough, Open sites contain mostly infringing content, which thereby avoids the “wide net” problem.

B. Endogenizing Enforcement

We have, to this point, largely ignored the role and behavior of the Vetted and Open websites. This lack of attention is in keeping with Assumption C above. If, as we assume, these markets are competitive, then such sites will offer infinitely elastic uploading opportunities at marginal cost prices, and engage in no strategic behavior.

In our analysis, the consequences of a safe harbor policy are reflected in the presence of a differential legal risk for those who lack this legal indemnity. While both sorts of sites may face similar baseline legal challenges, the introduction of credible safe harbor rules is modeled as simultaneously (i) creating an additional uploading cost for Vetted sites; and (ii) introducing a risk of legal action against a site lacking protection. This risk rebounds to some degree on uploaders using that site, possibly including some uploaders of legal content.

It is not likely that the level of legal risk, represented here by π , is completely determined by the law. Rather, the law gives private actors the means and incentives to pursue remedies through complaints and litigation, and it is probable that the level of such activities reflect the level of infringements. In this simple telling, though, infringement only occurs on Open sites, and the level of this infringement is measured by F . Thus, as a first attempt to endogenize enforcement action (hence π), we suppose that the probability an Open site with infringing content is disrupted is given by the relationship $\pi = \alpha F$ for some given positive constant α . We can now analyze the equilibrium level of enforcement

under the safe harbor mechanism.

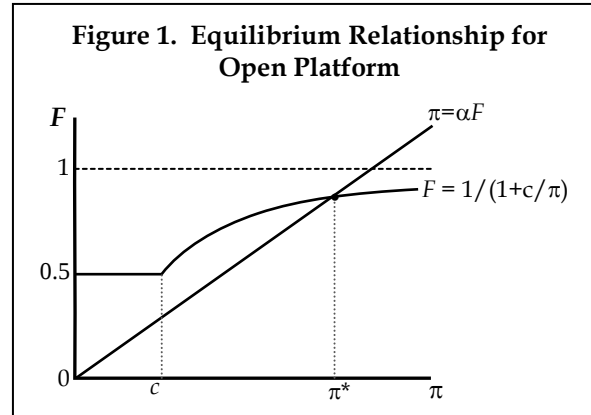


Figure 1 above illustrates a plausible generic equilibrium. This figure is drawn under the assumption that the threat for infringers is sufficiently strong ($\alpha > 2c$, ensuring the lines labeled π and F intersect). The share of infringing material F is measured on the vertical axis, and the enforcement level π on the horizontal axis. In this case, there exists an equilibrium level of enforcement π^* , which is consistent with the equilibrium level of infringement on Open sites. F equals 0.5 up until $\pi = c$, since we have assumed half of all content is infringing and all uploaders are pooled on the Open site. When $\pi > c$, then non-infringing content migrates to the Vetted sites, increasing the share of infringing content on Open sites, as illustrated by the change in the shape of $F = 1/(1 + c/\pi)$ at c on the horizontal axis.

In the figure, the equilibrium is π^* , where the π and F lines intersect. Inspection of the diagram and underlying equations reveals that this equilibrium is “stable” in the usual sense. The reduced form expression for equilibrium enforcement is:

$$\pi^* = \alpha - c \quad (5)$$

The expression states that the strength of property enforcement π is greater when the legal system makes it easy to enforce intellectual property rights (α is larger), and when the uploading cost differential between the Vetted and Open platforms c is smaller.

While our model is not dynamic, the expression has a practical temporal meaning. In the early days of the Internet, vetting content was costlier than it is today. With the development of content identification technology, which is increasingly widespread and available from third

parties,⁴² the relative costs between uploading on Vetted and Open sites is much lower and should continue to shrink. Consequently, the optimal sanction should be larger today than in the past, suggesting safe harbor is not temporally fixed but should adjust to changing market conditions.

C. Summary

Safe harbor rules, if they mean anything, create a differential legal risk to websites hosting illegal content. Obtaining safe harbor protection, though, is costly, as it implies the implementation of some type of content identification system, with the attendant costs of registration, screening, and so on. When the UUC platform industry is competitive then, in the baseline sense, Vetted sites (which qualify for safe harbor) need to offer some countervailing benefit for uploaders of non-infringing files to overcome the additional compliance costs. This differential is the fundamental function of safe harbor provisions, and it works to the extent that it is able to create sufficient alternative incentives. Weak rules will probably result in the same outcomes as no rules since, with competition, any cost disadvantage is a significant handicap. If the Internet is to evolve in a way that permits platforms to develop while also protect intellectual property, as the “grand bargain” implies, then stronger sanctions for platforms that host and distribute infringing materials are required.⁴³

D. Extensions and Qualifications

There are several significant factors affecting online infringement that are not encompassed in the earlier analysis. In this section, we will discuss several of the most important of these factors. As we will see, the basic logic of our results remains, though with qualifications.

First, the analysis assumes infinitely inelastic supplies of both infringing and legitimate uploads. This simplification frees us from having to consider effects on the extensive margin, in which changes in policy or cost parameters lead to different numbers of uploads in equilibrium. This may strike the reader as quite odd, since keeping infringing material off the Internet is presumably a basic purpose of public policy towards copyright and safe harbor rules. Interestingly, this complication is less nuanced than might appear. Suppose that the uploading cost for an Open platform is c_1 and c_2 for a Vetted platform, where $c_2 > c_1 > 0$. This complication will provide for elastic supplies of both infringing and non-infringing uploads. In this case, owners of legitimate files will choose the Vetted site when their value is high

⁴² See *supra* notes 27–28 and accompanying text.

⁴³ The analysis here presumes the goal is to balance infringement and the growth of UUC platforms. We do not provide a general equilibrium analysis of the economic welfare consequences of such policies, which may involve numerous tradeoffs.

enough, so that $\pi p > (c_2 - c_1)$. That is, the profit put “at risk” by uploading on the Open site exceeds the extra cost required to upload on the Vetted platform. Some “intermediate value” non-infringing material will be put on the Open platform, and the lowest valued material will not be uploaded at all. Again, by assumption, infringing matter can only be uploaded on the Open platform, and very low valued files will not be uploaded (the value to the uploader is too small to cover any cost).

The comparative statics of the sorting described above is fairly straightforward. An increase in π , representing strengthening infringement liability on UUC platforms, will increase uploading to Vetted platforms, decrease uploading of *non-infringing* material at Open platforms, and suppress uploading of low valued legitimate material. Simultaneously, uploading infringing matter, which occurs only on Open platforms, will decline. Thus, while Vetted platforms will receive more uploading, Open platforms, which will diminish in overall content, might exhibit either an increase or decrease in the proportion of infringing material, depending on the underlying distributions of values.

Our model also avoids incorporating a very visible aspect of infringement: when a movie or song is available on a UUC platform “for free,” it is much more difficult to get customers to pay for it through a legitimate channel (e.g., Netflix or Spotify), reducing the income of rights-holders. Indeed, in many respects, this phenomenon is fundamental for the case for the protection of intellectual property. If the creators of works cannot realize income from their property, then they will cease making it, impoverishing society.⁴⁴ Limiting the amount of stolen material on the Internet is a crucial part of this process, and safe harbor rules affect the ability of rights-holders to protect their investments.

From the standpoint of our analysis, one can imagine that the amount of infringing material on the Internet negatively affects the potential value obtained from uploading non-infringing material, thus shifting the value distribution to the left. Ignoring the equilibrium determination of π in this case, which could be quite complicated, the first-order effect of a reduction in the value of legal property is to reduce uploading on Vetted platforms with an ambiguous effect on non-infringing uploads on Open platforms. The latter occurs because, while some property formerly uploaded on a Vetted platform would be moved to an Open platform if its value fell, so also can some low value material uploaded on Open platforms be dropped entirely. The outcome depends on the underlying distributions and how the reduction in value is specified. If, following our original assumptions, all property is

⁴⁴ T. Randolph Beard, George S. Ford, Lawrence J. Spiwak & Michael Stern, *Social Well-Being and IP Theft: A Dynamic Economic Analysis*, PHOENIX CTR. POL’Y BULL.: NO. 32 (Mar. 2012), <http://www.phoenix-center.org/PolicyBulletin/PCPB32Final.pdf>.

uploaded in equilibrium, then we would observe fewer Vetted platforms, more Open platforms, and a lower proportion of infringing material on the Open platforms as the remaining low-value non-infringing material is uploaded to Open platforms.

The lesson from this is clear: when the presence of infringing works on the Internet reduces the incomes of legitimate works, this can be expected to change the platform industry market structure, with increased presence of non-infringing material on Open platforms, and, therefore, increased risk that some of this material could be affected by legal proceedings against UUC platforms.

Finally, implementing an identification system may be cost prohibitive for some UUC platforms, thereby altering the market structure and prices.⁴⁵ With uniform application, the price effects are likely to be attenuated by competition among similarly situated platforms. Of course, any impact of higher prices or content effects must be weighed against the social losses from the theft of property, including the direct and indirect effects of infringing activity.⁴⁶ Such tradeoffs are common. In many respects, the online intermediaries' arguments against content identification are the same as, say, the coal industry's arguments against environmental policies that raise coal prices and reduce industry employment.⁴⁷ Solutions to undesirable behaviors may be costly, but the solutions often create benefits well in excess of the costs.

E. Legislative Solutions

Specific legislative solutions are beyond the scope of our analysis. We believe, however, that the analysis, while a simplification of the issue, points to the target areas where the safe harbor regime could be improved. First, vetting of uploaded material prior to its availability for consumption on the UUC platform should be encouraged. To encourage the use of vetting systems, Congress could borrow from the requirement placed on the UUC platforms for repeat infringer policies. That is, the protection of the safe harbors could be limited to UUC platforms with formal vetting policies and systems. These systems are available and can be effective, so there is little excuse for a failure to implement a vetting system on UUC platforms commonly used for infringing acts (as may be determined by the receipt of takedown notices).

Second, the statutory language could provide greater specificity

⁴⁵ Cf., Jennifer M. Urban, Joe Karaganis & Brianna L. Schofield, *Notice and Takedown in Everyday Practice*, U.C. BERKELEY PUB. L. RES. PAPER NO. 2755628 (Mar. 22, 2017)).

⁴⁶ Thomas Randolph Beard, George S. Ford, Liliana V. Stern & Michael L. Stern, *Theft and Welfare in General Equilibrium: A Theoretical Note*, 2 THEORETICAL ECON. LETTERS 470 (2012).

⁴⁷ See Nicholas D. Loris, *The Assault on Coal and American Consumers*, HERITAGE FOUND BACKGROUND (July 23, 2012), http://thf_media.s3.amazonaws.com/2012/pdf/bg2709.pdf.

surrounding the financial benefits of hosting, indexing, or distributing infringing material. Content identification systems have arisen, in part, from the desire of UUC platforms to monetize the viewing of material they host as viewership (and thus advertising potential) is higher for professionally-generated and protected content.⁴⁸ Evidence of direct financial benefit from the consumption of infringing works on an UUC platform weakens the safe harbor defense, thereby driving the larger UUC platforms to implement vetting technologies to create a desirable user experience but retain limited liability. It seems, therefore, the “financial” considerations of section 512 are binding in some respects,⁴⁹ but the continued epidemic of digital piracy suggests the statute should be strengthened in this regard.

These modifications to the safe harbor policies are not original to this Article but are already under consideration in the European Union. Though some details remained to be finalized, Article 13 of the *Directive Proposal* recommends, for instance, that

Information society service providers that store and provide to the public access to large amounts of works or other subject-matter uploaded by their users shall, in cooperation with rightholders, take measures to ensure the functioning of agreements concluded with rightholders for the use of their works or other subject-matter or to prevent the availability on their services of works or other subject-matter identified by rightholders through the cooperation with the service providers. Those measures, such as the use of effective content recognition technologies, shall be appropriate and proportionate. The service providers shall provide rightholders with adequate information on the functioning and the deployment of the measures, as well as, when relevant, adequate reporting on the recognition and use of the works and other subject-matter.⁵⁰

In effect, the *Directive Proposal* aims to adjust the liability regime for online intermediaries so they take some responsibility for the attenuation of infringement and share revenues with rights-holders. While not a requirement, the *Directive Proposal* points to the use of content identification systems as a responsible approach to detecting and addressing infringement, especially for intermediaries that provide

⁴⁸ See, e.g., Mark Mulligan, *State of the YouTube Music Economy*, MIDIA RES. (July 12, 2016), <https://www.midiaresearch.com/blog/the-state-of-the-youtube-music-economy> (“Music represents 12% of all YouTube viewing time.”); Tim Ingham, *YouTube Earnt \$9bn in Revenue Last Year, Towering Over Spotify*, MUSIC BUS. WORLDWIDE (Jan. 5, 2016), <http://www.musicbusinessworldwide.com/youtube-will-earn-9bn-in-revenue-this-year-towering-over-spotify> (58% of YouTube’s monthly viewing is music videos from channels, Vevo and Warner Music); Todd Spangler, *YouTube Standardizes Ad-Revenue Split for All Partners, But Offers Upside Potential*, VARIETY (Nov. 1, 2013, 4:39 PM), <http://variety.com/2013/digital/news/youtube-standardizes-ad-revenue-split-for-all-partners-but-offers-upside-potential-1200786223> (“[T]he majority of YouTube’s user-generated content does not have advertising, so YouTube must recoup its costs from content that it can monetize.”); Bobbie Johnson, *Does YouTube actually make any money?*, GUARDIAN (Apr. 6, 2009, 10:58 PM), <https://www.theguardian.com/technology/blog/2009/apr/07/youtube-video-losses>.

⁴⁹ See generally 17 U.S.C. § 512 (2012).

⁵⁰ *Directive Proposal*, *supra* note 31, at 29.

“access to large amounts of works.”⁵¹

Article 14 of the *Directive Proposal* limits the application of the safe harbor to passive intermediaries. With some exceptions, online intermediaries that

... store and provide access to the public to copyright protected works or other subject-matter uploaded by their users, thereby going beyond the mere provision of physical facilities and performing an act of communication to the public, they are obliged to conclude licensing agreements with rightholders.⁵²

An “active” role includes, but is apparently not limited to, “optimising the presentation of the uploaded works or subject-matter or promoting them, irrespective of the nature of the means used therefor.”⁵³ While it is difficult to predict the efficacy of these changes since they are not final nor tested in court, these proposed changes to the safe harbor policy have sound economic footing and should encourage more responsible behavior by online intermediaries with respect to copyright infringement.

CONCLUSION

The meteoric rise of the Internet has changed the way we communicate, conduct commerce, entertain ourselves and more. Public policy has nurtured the Internet in its infancy, but an avalanche of unsavory, dangerous, and illegal online behavior has raised serious questions about how to treat a modern and mature Internet. Significant influences on the types of content appearing on the Internet are the safe harbor provisions of section 230 of the CDA and section 512 of the DMCA. Certainly, online intermediaries wish to preserve their near blanket immunity from legal liability for any content posted to their services, but the current safe harbor rules appear to have resulted in an imbalance favoring online intermediaries and snubbing rights-holders as well as, with regard to the CDA, human decency.

In this Article, we offer an economic model of safe harbors to help guide the reform of safe harbors. We find that the limits on liability afforded by safe harbor protection affect the evolution of platforms reliant on content posted by users. As we see it, limited liability for these platforms promotes the success of platforms with high shares of illegal material—to the detriment of platforms that properly vet posted files for infringing and illegal activity. Put simply, vetting is costly, placing platforms with a conscience at an economic disadvantage in a competitive market place.

⁵¹ *Id.* at 10.

⁵² *Id.* at 20.

⁵³ *Id.*

Increasing the risk of liability on platforms for infringing materials results in a separating equilibrium, where two types of platforms will arise—those offering only (or mostly) legitimate content, and those offering a market-determined combination of illegal, unsavory, and low value content. Thus, the introduction of increased platform liability can be expected to ultimately change the structure of the platform industry, allowing socially responsible platforms that vet their content to thrive while at the same time exposing targets for enforcement action.

Safe harbors were implemented to help the Internet grow, but as cyberspace reaches the age of majority, it is reasonable to expect more from online intermediaries facilitating the distribution of infringing and disturbing content. Strict liability for online intermediaries may not be the answer, but neither is absolute immunity. As for proper balance between the two, the continued epidemic of digital piracy suggests U.S. laws are too weak on infringement. Legal immunity should be predicated on responsible behavior. With the proper incentives in place, lawmakers can encourage the next Google and Facebook to help build an Internet that better reflects legal and ethical standards and encourages new investment, creativity, and innovation.