

PHOENIX FOR ADVANCED
LEGAL & ECONOMIC
C E N T E R PUBLIC POLICY STUDIES
www.phoenix-center.org

PHOENIX CENTER POLICY PAPER SERIES

Phoenix Center Policy Paper Number 52:

Fixing Safe Harbor: An Economic Analysis

T. Randolph Beard, PhD
George S. Ford, PhD
Michael Stern, PhD

(August 2017)

© Phoenix Center for Advanced Legal and Economic Public Policy Studies, T. Randolph Beard, George S. Ford and Michael Stern (2017)

Phoenix Center Policy Paper No. 52

Fixing Safe Harbor: An Economic Analysis

T. Randolph Beard, PhD*
George S. Ford, PhD†
Michael Stern, PhD♦

(© Phoenix Center for Advanced Legal & Economic Public Policy Studies, T. Randolph Beard, George S. Ford and Michael Stern (2017).)

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 POLICY 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.

* Senior Fellow, Phoenix Center for Advanced Legal & Economic Public Policy Studies; Professor of Economics, Auburn University.

† Chief Economist, Phoenix Center for Advanced Legal & Economic Public Policy Studies. The views expressed in this paper are the authors’ alone and do not represent the views of the Phoenix Center or its staff.

♦ Senior Fellow, Phoenix Center for Advanced Legal & Economic Public Policy Studies; Professor of Economics, Auburn University.

TABLE OF CONTENTS:

I. Introduction	2
II. Background.....	5
III. An Economic Model	13
A. The Model.....	15
1. Uploading Non-Infringing Works.....	17
2. Uploading Infringing Works.....	18
B. Endogenizing Enforcement.....	18
C. Summary.....	20
D. Extensions and Qualifications	20
E. Legislative Solutions	23
IV. Conclusion	25

I. 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 United States Congress, faced with an

¹ R.P. Latham, C.C. Butzer, and J.T. Brown, *Legal Implications of User-Generated Content: Youtube, MySpace, Facebook*, 20 INTELLECTUAL PROPERTY & TECHNOLOGY LAW JOURNAL 1-11 (2008) (available at: <http://images.jw.com/com/publications/939.pdf>); J.C. Ginsburg, *User-Generated Content Sites and Section 512 of the US Copyright Act, in Copyright Enforcement and the Internet* (2010) (I.A. Stamatoudi, ed.) (available at: http://lsr.nellco.org/cgi/viewcontent.cgi?article=1084&context=columbia_pllt); D. Lichtman and W. Landes, *Indirect Liability for Copyright Infringement: An Economic Perspective*, 16 HARVARD JOURNAL OF LAW & TECHNOLOGY 395-410 (2003) (available at: http://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=9458&context=journal_articles); THE DIGITAL MILLENNIUM COPYRIGHT ACT OF 1998, SENATE REPORT 105-190 (May 11, 1998) (hereinafter "SENATE REPORT") at p. 8 ("In the ordinary course of their operations service providers must engage in all kinds of acts that expose them to potential copyright infringement liability") (available at: <https://www.congress.gov/105/crpt/srpt190/CRPT-105srpt190.pdf>); K. Pappalardo, *Duty and Control in Intermediary Copyright Liability: An Australian Perspective*, 4 IP THEORY 12-27 (2014) (available at: <http://www.repository.law.indiana.edu/ipt/vol4/iss1/2>); C.L. Saw and W.B. Chick,

“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 [rightsholders] can protect their work from piracy,”⁴ digital piracy remains rampant on UUC platforms.⁵ In light of these facts, in 2015 the U.S. Copyright

Revisiting Authorisation Liability in Copyright Law, 24 SINGAPORE ACADEMY OF LAW JOURNAL 698-744 (2012) (available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2205635).

² 17 U.S.C. § 512; DIGITAL MILLENNIUM COPYRIGHT ACT - CONFERENCE REPORT, 144 CONGRESSIONAL RECORD S11887, S11888 (October 2, 1988) (hereinafter “SENATE CONFERENCE REPORT”) (available at: <https://www.congress.gov/congressional-record/1998/10/8/senate-section/article/S11887-1>).

³ SENATE CONFERENCE REPORT, *id.* 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.

⁴ DIGITAL MILLENNIUM COPYRIGHT ACT, H. REPT. 105-551 (July 22, 1998) at p. 23 (hereinafter “HOUSE REPORT”) (available at: <https://www.congress.gov/105/crpt/hrpt551/CRPT-105hrpt551-pt2.pdf>).

⁵ *See, e.g.,* V. Peterson, *Digital Piracy Issues and Protecting Intellectual Property*, THE BALANCE (October 17, 2016) (available at: <https://www.thebalance.com/digital-piracy-intellectual-property-2800200>); D.N. Barnett, *THE ONGOING FIGHT AGAINST DIGITAL PIRACY* (2017); *Shadow Market: 2011 BSA Global Software Piracy Study*, Business Software Alliance (May 2012) (available at: http://globalstudy.bsa.org/2011/downloads/study_pdf/2011_BSA_Piracy_Study-Standard.pdf); P. Kehoe, *What is Digital Piracy Running Rampant, and What Can We Do About It?*, SECURITYINTELLIGENCE (July 9, 2015) (available at: <https://securityintelligence.com/why-is-digital-piracy-running-rampant-and-what-can-we-do-about-it>); Z. Whittaker, *70 Percent Find Software Piracy ‘Socially Acceptable’*, ZDNET (March 2, 2011) (available at: <http://www.zdnet.com/article/70-percent-find-software-piracy-socially-acceptable>); C. Ruen, *Bored with Hollywood Blockbusters? Blame Digital Piracy*, NEW REPUBLIC (July 25, 2014) (available at: <https://newrepublic.com/article/118858/digital-piracy-ruining-pop-culture>).

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 POLICY PAPER 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 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

⁶ Library of Congress - U.S. Copyright Office, *Section 512 Study: Notice and Request for Public Comment*, Docket No. 2015-7, 80 Fed. Reg. 81862 (December 31, 2015) (available at: <https://www.copyright.gov/fedreg/2015/80fr81862.pdf>).

⁷ V. Bouche, *A Report on the Use of Technology to Recruit, Groom and Sell Domestic Minor Sex Trafficking Victims*, Thorn: Digital Defenders of Children (January 2015) (available at: https://2715111qnwey246mkc1vzqg0-wpengine.netdna-ssl.com/wp-content/uploads/2015/02/Survivor_Survey_r5.pdf); R. Couch, *70 Percent Of Child Sex Trafficking Victims Are Sold Online: Study*, HUFFINGTON POST (July 25, 2014) (available at: http://www.huffingtonpost.com/2014/07/25/sex-trafficking-in-the-us_n_5621481.html); S. Jeong, *A New Bill to Fight Sex Trafficking Would Destroy a Core Pillar of Internet Freedom*, THE VERGE (August 1, 2017) (available at: <https://www.theverge.com/2017/8/1/16072680/cda-230-stop-enabling-sex-traffickers-act-liability-shield-senate-backpage>).

⁸ See, e.g., the content ID product available from Audible Magic Content ID (<https://www.audiblemagic.com>).

⁹ Lefort (2010) analyzes a similar problem when rightsholders 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. M. Lefort, *Copyright Enforcement and Quality Differentiation on the Internet*, 10 REVIEW OF ECONOMIC RESEARCH ON COPYRIGHT ISSUES 27-54 (2013) (available at: <http://ssrn.com/abstract=2381877>).

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

II. 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

¹⁰ The concern applies to not only site blocking but to other blocking and filtering technologies. See, e.g., *PROTECT IP / SOPA Breaks the Internet, Fight for the Future* (2011) (available at: <https://vimeo.com/31100268>); *Freedom of Expression Unfiltered: How Blocking and Filtering Affect Free Speech*, ARTICLE19 POLICY BRIEF (December 2016) (available at: https://www.article19.org/data/files/medialibrary/38586/Blocking_and_filtering_final.pdf); M. Ingram, *When Do Twitter Block Lists Start Infringing on Free Speech?*, FORTUNE (June 12, 2016) (available at: <http://fortune.com/2015/06/12/twitter-free-speech>); A.K. Pace, *Lemonade from Lemons*, AMERICAN LIBRARIES MAGAZINE (January 2005) (available at: <https://americanlibrariesmagazine.org/lemonade-from-lemons>); J. Taylor, *Bad Piracy Legislation Leaves Rights Holders Lost at Sea*, CRIKEY (June 27, 2016) (available at: <https://www.crikey.com.au/2016/06/27/bad-piracy-legislation-confuses-courts>); H. Francis, *Fears Thousands of Legitimate Websites Could be Blocked Under Anti-Piracy, Site-Blocking Regime*, SYDNEY MORNING NEWS (April 21, 2015) (available at: <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, *UK ‘Porn Filter’ Blocks Legitimate File-Sharing Services*, TORRENTFREAK (January 3, 2014) (available at: <https://torrentfreak.com/uk-porn-filter-blocks-legitimate-file-sharing-services-and-torrentfreak-140103>).

¹¹ Mixing infringing and legitimate content may be used by defendants as 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) (“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.”).

online intermediaries.¹² In the U.S., safe harbor 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 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

¹² 47 U.S.C. § 512. See also *ALS Scan, Inc. v. RemarQ Communities, Inc.*, 239 F.3d 619, 625 (4th Cir. 2001) (“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 system engages through a technological process initiated by another without the knowledge of the service provider” (citing DIGITAL MILLENNIUM COPYRIGHT ACT, HOUSE CONFERENCE REPORT, REPORT NO. 105-786 (October 8, 1998) at 72; HOUSE REPORT, *supra* n. 4 at 11 (1998)); B.T. Yeh, *Safe Harbor for Online Service Providers Under Section 512(c) of the Digital Millennium Copyright Act*, Congressional Research Service 7-5700 (March 26, 2014) (available at: http://www.ipmall.info/sites/default/files/hosted_resources/crs/R43436_140326.pdf); SENATE REPORT, *supra* n. 1 at p. 65 (“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”); J. Litman, *DIGITAL COPYRIGHT: PROTECTING INTELLECTUAL PROPERTY ON THE INTERNET* (2000).

¹³ 17 U.S.C. §§ 512 (a)–(d).

¹⁴ *ALS Scan, supra* n. 12, 239 F.3d at 625; see also *Capitol Records Inc. v. MP3Tunes, LLC*, 821 F. Supp. 627, 363 (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).

¹⁶ See 17 U.S.C. § 512(i)(1).

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 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 U.S., 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

¹⁷ 17 U.S.C. § 512. Explanations of Section 512 are bountiful. See, e.g., J.C. Ginsburg, *User-Generated Content Sites and Section 512 of the US Copyright Act*, in COPYRIGHT ENFORCEMENT AND THE INTERNET (ed., I.A. Stamtoudi) (2010) (available at: <https://ssrn.com/abstract=1711924>); M. Urban and L. Quilter, *Efficient Process or “Chilling Effects”? Takedown Notices Under Section 512 of the Digital Millennium Copyright Act*, 22 SANTA CLARA COMPUTER AND HIGH TECHNOLOGY LAW JOURNAL 621-693 (2006) (available at: <http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1413&context=chtlj>); D. Seng, *The State of the Discordant Union: An Empirical Analysis of DMCA Takedown Notices*, 18 VIRGINIA LAW JOURNAL OF LAW & TECHNOLOGY 369-473 (2014) (available at: http://www.vjolt.net/vol18/issue3/v18i3_2-Seng.pdf); A.C. Yen, *Internet Service Provider Liability for Subscriber Copyright Infringement, Enterprise Liability and the First Amendment*, 88 Georgetown Law Journal 1-56 (2000); M. Peguera, *The DMCA Safe Harbors and Their European Counterparts: A Comparative Analysis of Some Common Problems*, 32 COLUMBIA JOURNAL OF LAW & THE ARTS 481- 512 (2009) (available at: <http://ssrn.com/abstract=1468433>).

¹⁸ INTERNET WORLD STATS: USAGE AND POPULATIONS STATISTICS (available at: <http://www.Internetworldstats.com/stats.htm>).

¹⁹ A. Perrin and M. Duggan, *Americans’ Internet Access: 2000-2015*, PEW RESEARCH CENTER, INTERNET & TECHNOLOGY (June 26, 2015) (available at: <http://www.pewInternet.org/2015/06/26/americans-Internet-access-2000-2015>); U.S. population: <https://www.census.gov/data/tables/2016/demo/popest/nation-total.html>.

²⁰ *The 25 Largest Internet Companies in the World*, Worldatlas.com (Feb 13, 2017; visited July 19, 2017) (available at: <http://www.worldatlas.com/articles/the-25-largest-internet-companies-in-the-world.html>).

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

With regard to protecting intellectual property rights, however, Section 512 has failed to reduce digital piracy to manageable levels. Over the years spanning 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 executed nearly 3 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 rightsholders, 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 the persistence of digital piracy under the privilege of safe harbor.²⁵

²² RIAA Shipments Database (2015) (see <https://www.riaa.com/the-riaa-revenue-and-shipment-database-is-back>).

²³ GOOGLE TRANSPARENCY REPORT (accessed July 24, 2017) (available at <https://www.google.com/transparencyreport/removals/copyright/?hl=en>).

²⁴ <https://en.oxforddictionaries.com/definition/us/whack-a-mole> ("An arcade game in which players use a mallet to hit toy moles, which appear at random, back into their holes."); D. Hartline, *Endless Whack-A-Mole: Why Notice-and-Staydown Just Makes Sense*, CENTER FOR THE PROTECTION OF INTELLECTUAL PROPERTY (January 14, 2016) (available at: <https://cpip.gmu.edu/2016/01/14/endless-whack-a-mole-why-notice-and-staydown-just-makes-sense>); P. Doda, *Structural Infringers: How to Protect Copyright Without Stifling Innovation*, INTERNATIONAL PUBLISHERS ASSOCIATION (June 30, 2016) (available at: <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.").

²⁵ B. Danaher, M.D. Smith, and R. Telang, *Website Blocking Revisited: The Effect of the UK November 2014 Blocks on Consumer Behavior*, Working Paper (April 18, 2016) (available at: <http://ssrn.com/abstract=2766795>); Incopro, *Site Blocking Efficacy in Portugal: September 2015 to October 2016* (May 2017) (available at: <http://www.incoproip.com/wp-content/uploads/2017/07/Site-Blocking-and-Piracy-Landscape-in-Portugal-FINAL.pdf>); Incopro, *Site Blocking Efficacy Study: United Kingdom* (November 13, 2014) (available at: http://auscreenassociation.film/uploads/reports/Incopro_Site_Blocking_Efficacy_Study-UK.pdf); M. Ellis, *Progress Against Piracy: MPA Finds Asia-Pacific Allies in Copyright-Infringement Fight*, FILM JOURNAL INTERNATIONAL (November 27, 2016) (available at: <http://www.filmjournal.com/features/progress-against-piracy-mpa-finds-asia-pacific-allies-copyright-infringement-fight>); *Site Blocking in the World*, MPAA (October 2015) (available at: <http://www.mpa-i.org/wp-content/uploads/2016/02/Site-Blocking-October-2015.pdf>); N. Cory, *How Website Blocking is Curbing Digital Piracy Without "Breaking the Internet"*, Information Technology

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 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

& Innovation Foundation (August 2016) (available at: <http://www2.itif.org/2016-website-blocking.pdf>).

²⁶ *Id.*

²⁷ Content ID arose from litigation between Viacom and Google. J. Stempel, *Google, Viacom Settle Landmark Youtube Lawsuit*, REUTERS (March 18, 2014) (available at: <http://www.reuters.com/article/us-google-viacom-lawsuit-idUSBREA2H11220140318>).

²⁸ G. Weiss, *As Facebook Video Swells, YouTube Creators Cry Foul Over Copyright Infringement*, ENTREPRENEUR (June 5, 2015) (available at: <https://www.entrepreneur.com/article/247047>); A. Ernst, *YouTube, Google Face Class Action Infringement Suit*, LAW360 (May 4, 2007) (available at: <https://www.law360.com/articles/24119/youtube-google-face-class-action-infringement-suit>); C. Warren, *How YouTube Fights Copyright Infringement*, MASHABLE (February 17, 2012) (available at: <http://mashable.com/2012/02/17/youtube-content-id-faq/#WdSxivXkJ5qZ>); M. Kosoff, *Facebook is Rolling Out a Solution to Its 'Freebooting' Problem*, BUSINESS INSIDER (August 27, 2015) (available at: <http://www.businessinsider.com/facebook-rolling-out-solution-to-its-freebooting-problem-2015-8>); R. Price, *Facebook's New Video Business is Awash with Copyright Infringement and Celebrities are Some of the Biggest Offenders*, BUSINESS INSIDER (May 6, 2015) (available at: <http://www.businessinsider.com/facebook-copyright-infringement-facebook-content-id-celebrities-2015-5?r=UK&IR=T>); B. Boroughf, *The Next Great YouTube: Improving Content Id to Foster Creativity, Cooperation, and Fair Compensation*, 25 ALBANY LAW JOURNAL OF SCIENCE & TECHNOLOGY 95-127 (2015) (available at: <http://www.albanylawjournal.org/Documents/Articles/25.1.95-Boroughf.pdf>); N. Alawadhi, *Content ID is Google's Code Against Piracy*, THE ECONOMIC TIMES (August 4, 2016) (available at: <http://economictimes.indiatimes.com/tech/internet/Content-ID-is-googles-code-against-piracy/articleshow/53533936.cms>); S. Hamedy, *YouTube has Paid \$2 Billion to rights Holders Through Content ID*, MASHABLE (July 13, 2016) (available at: <http://mashable.com/2016/07/13/youtube-content-id-piracy-update/#e2FpNVjLjSqt>); E. Seidler, *YouTube's Content Id Easily Fooled*, Vox Indie (June 30, 2016) (available at:

YouTube claims it is now able 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 that 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

<http://voxindie.org/youtubes-content-id-easily-fooled>); T. Spangler, *YouTube: Music Biz Generates Half Its Revenue on the Site From Copyright-Identification System*, VARIETY (July 13, 2016) (available at: <http://variety.com/2016/digital/news/youtube-music-copyright-content-id-1201813307>); D. Rys, *Facebook Developing Copyright ID System to Stem Music Rights Infringement*, BILLBOARD (December 28, 2016) (available at: <http://www.billboard.com/articles/business/7639969/facebook-developing-copyright-id-system-music-rights-infringement>); David, *Q&A: Our New Content Identification Systems*, SOUND CLOUD BLOG (January 1, 2015) (<https://blog.soundcloud.com/2011/01/05/q-and-a-content-identification-system>); *Copyright Compliance Service, Compliance Automation for Media Sharing Platforms*, Audible Magic (viewed July 18, 2017) (available at: <https://www.audiblemagic.com/compliance-service>); A. Flanagan, *Vimeo to Launch Music Copyright ID System*, BILLBOARD BIZ (May 21, 2014) (available at: <http://www.billboard.com/biz/articles/news/digital-and-mobile/6092241/vimeo-to-launch-music-copyright-id-system-exclusive>).

²⁹ P. Resnikoff, *99.5% of All Infringing Music Videos are Resolved by Content ID, YouTube Claims*, DIGITAL MUSIC NEWS (August 8, 2016) (available at: <https://www.digitalmusicnews.com/2016/08/08/copyright-problems-resolved-content-id>), R. Levine, *"It's a System That Is Rigged Against the Artists": The War Against YouTube*, BILLBOARD (May 5, 2016) (available at: <http://www.billboard.com/articles/business/7356794/youtube-criticism-labels-artists-managers-payouts>); T. Ingham, *YouTube's Content ID Fails to Spot 20%-40% of Music Recordings*, MUSIC BUSINESS WORLDWIDE (July 13, 2016) (available at: <https://www.musicbusinessworldwide.com/youtubes-content-id-fails-spot-20-40>).

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* requires online intermediaries to “prevent the availability” of infringing works with measures “such as the use of effective content recognition technologies.”³¹ Also, 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 rightsholders 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

³⁰ R.H. Thaler and C.R. Sunstein, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2009).

³¹ *Proposal for a Directive of the European Parliament and of the Council on Copyright in the Digital Single Market*, COM(2016) 593 Final (September 14, 2016), Art. 13 (hereinafter “*Directive Proposal*”) (available at: <https://ec.europa.eu/digital-single-market/en/news/proposal-directive-european-parliament-and-council-copyright-digital-single-market>).

³² *Id.* at p. 38.

³³ J. Cheng, *BitTorrent Census: About 99% of Files Copyright Infringing*, ARSTECHNICA (January 29, 2010) (available at: <https://arstechnica.com/information-technology/2010/01/bittorrent-census-about-99-of-files-copyright-infringing>); D. Sanchez, *The Top 10 Free Music Download and Piracy Sites of 2016*, DIGITAL MUSIC NEWS (December 22, 2016) (available at: <https://www.digitalmusicnews.com/2016/12/22/free-music-download>); I. Birnbaum, *The State of PC Piracy in 2016*, PC GAMER (August 10, 2016) (available at: <http://www.pcgamer.com/the-state-of-pc-piracy-in-2016>); *Best Torrenting Sites: Top 10 Best Torrent Websites 2017*, YouTube Video (April 10, 2017) (available at: <https://www.youtube.com/watch?v=wM0zY6NSEaE>); S. Dent, *Music Labels Sue YouTube Ripping Site Over Piracy*, ENGADGET (September 27, 2016) (available at: <https://www.engadget.com/2016/09/27/music-labels-sue-youtube-ripping-site-over-piracy>); A. Castle, *How to Download Audio From Any Streaming Video*, PCWORLD (November 27, 2014) (available

the cost of reducing infringement by a fixed amount is a complex problem.³⁴ Effectively allocating liability requires evidence on 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. 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, cyberlockers, 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 PAPER the full implications of safe harbors. For instance, safe harbors may distort the bargains between UUC platforms and rightholders for licenses, as has been claimed in the “value grab” debate.³⁶ Such distortions may be significant for rightholder income, both directly and indirectly by reducing the value of the content to platforms that must obtain rights through

at: <http://www.pcworld.com/article/2852325/how-to-download-audio-from-any-streaming-video.html>); L. O’Reilly, *A YouTube Video that Claims Facebook is ‘Stealing Billions of Views’ is Going Viral*, BUSINESS INSIDER (November 12, 2015) (available at: <http://www.businessinsider.com/how-facebook-is-stealing-billions-of-views-youtube-video-goes-viral-2015-11?r=UK&IR=T>); N. Martinez, *Video Creators are Losing Millions from Facebook Video Posts*, ART LAW JOURNAL (September 3, 2015) (available at: <https://artlawjournal.com/creators-losing-millions-facebook>).

³⁴ See, e.g., R. Cooter and T. Ulen, *LAW AND ECONOMICS* (2016) (available at: <http://scholarship.law.berkeley.edu/books/2>); S. Shavell and S. Shavell, *Economic Analysis of Accident Law* (1987); S. Shavell and S. Shavell, *Strict Liability v. Negligence*, 9 JOURNAL OF LEGAL STUDIES 1-25 (1980); H. Schäfer and A. Schönenberger, *Strict Liability versus Negligence*, ENCYCLOPEDIA OF LAW & ECONOMICS (1999) (available at: <http://reference.findlaw.com/lawandconomics/3100-strict-liability-v-negligence.pdf>).

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

³⁶ T.R. Beard, G.S. Ford and M. Stern, *Safe Harbors and the Evolution of Music Retailing*, PHOENIX CENTER POLICY BULLETIN NO. 41 (March 2017) (available at: <http://phoenix-center.org/PolicyBulletin/PCPB41Final.pdf>); M. Schneider, *Content ID is Still Just Piracy in Disguise*, MUSIC ANSWERS (February 2017) (available at: <http://www.musicanswers.org/content-id>).

normal channels (e.g., Netflix, Google Play, and so forth).³⁷ Such concerns are left to others or for future research.

III. 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 features:

- A. Viewers/consumers of online material are largely or completely indifferent to its 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;
- D. Those uploading material, both legal and infringing, select their uploading locations based on the net private benefits they receive from their choices;
- 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 these core assumptions is straightforward. First, in the great majority of cases, it is probably 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

³⁷ *Id.*

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).

(Assumption A).³⁹ Similarly, observed practice in the uploading marketplace does illustrate that 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 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 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)

³⁹ See, e.g., A. Moscaritolo, *Americans Love Their Pirated Content*, PCMAG (January 20, 2017) (available at: <http://www.pcmag.com/news/351185/americans-love-their-pirated-content>); T. Spengler, *Piracy Survey: 39% of U.S. Consumers Don't Care That Studios Lose Money From Illegal Sharing*, VARIETY (January 18, 2017) (available at: <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) (available at: <https://resources.irdeto.com/irdeto-global-consumer-piracy-survey/irdeto-global-customer-piracy-survey-report>); A. Lenhart and M. Madden, *Music Downloading, File-sharing and Copyright*, PEW RESEARCH CENTER (July 2003) (available at: <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.”); A. Dachis, *How You're Breaking the Law Every Day (And What You Can Do About It)*, LIFEHACKER (February 27, 2012) (available at: <http://lifehacker.com/5888488/how-youre-breaking-the-law-every-day-and-what-you-can-do-about-it>).

⁴⁰ T. Ingham, *YouTube's Content ID Fails to Spot 20%-40% of Music Recordings*, MUSIC BUSINESS WORLDWIDE (July 13, 2016) (available at: <https://www.musicbusinessworldwide.com/youtubes-content-id-fails-spot-20-40>).

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, creating costs for its owners and, given Assumption (C), causing some costs to rebound onto its users. As we will see, in order 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 up front from uploading their material, and we interpret these as private costs they incur through their efforts at complying with the uploading requirements of a particular website. Websites are taken to be of two particular 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 a 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:

$$U = p - c. \tag{1}$$

As shown in the expression, this cost (c) need not be in the form of a direct financial payment by 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:

$$U = (1 - \pi)p, \tag{2}$$

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.

⁴¹ In some cases, private contracts may provide a "safe harbor" like protection like "DMCA Plus." See, e.g., M. Sag, *Internet Safe Harbors and the Transformation of Copyright Law*, 93 NOTRE DAME LAW REVIEW (forthcoming 2017) (available at: <https://ssrn.com/abstract=2830184>); A. Bridy, *Copyright's Digital Deputies: DMCA-Plus Enforcement by Internet Intermediaries*, RESEARCH HANDBOOK ON ELECTRONIC COMMERCE LAW (J.A. Rothchild, ed.) (2016) (available at: <https://ssrn.com/abstract=2628827>).

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 will begin by assuming all material, infringing or not, will be uploaded, and move to consideration of the extensive margin later in the analysis (that is, we assume for now a fixed quantity of content). Setting the extensive margin aside, 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:

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

which simply 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 the avoidance by uploaders 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, since, if enforcement is strong enough, Open sites contain mostly infringing content thereby avoiding 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 our 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, and 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 (and, 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.

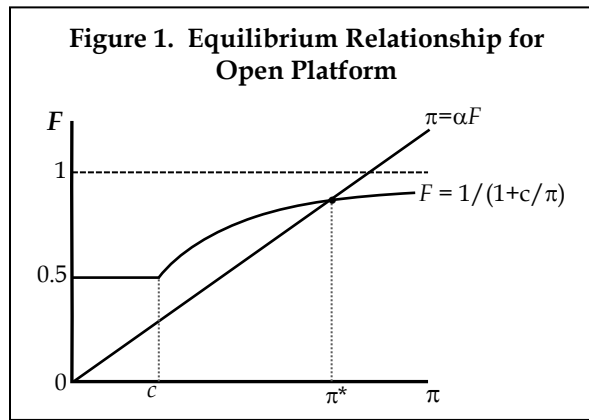


Figure 1 above illustrates a plausible generic equilibrium. This figure is drawn under the assumption that the threat for infringers is sufficiently strong ($\alpha > 2c$, ensuring the lines labeled π and F intersect). The share of infringing material F is measured on the vertical axis, and the enforcement 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:

$$\pi^* = \alpha - c. \tag{4}$$

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 a dynamic one, the expression has a practical temporal meaning. In the early days of the Internet, vetting content was more costly than it is today. With the development of content identification technology, which is increasingly widespread and available from third parties, 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 protecting intellectual property, as the “grand bargain” implies, then stronger sanctions for platforms that host and distribute infringing materials is required.⁴²

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

⁴² 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.

most important of these factors. As we will see, the basic logic of our results remains, though sometimes 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. To see this, suppose that the uploading cost for an Open platform is c_1 and that for a Vetted platform is c_2 , 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 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 , which we take to represent a strengthening of liability on UUC platforms for infringement, 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 of 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, the outcome 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.⁴³ Limiting the amount of stolen material on the Internet is a crucial part of this process, and safe harbor rules affect the ability of rightsholders 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. This 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 particular outcome depends on the underlying distributions and how the reduction in value is specified. If, following our original assumptions, all property is 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 sites.

The lesson from this is fairly 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 the Open platforms, and, therefore, greater 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.⁴⁴ 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,

⁴³ T.R. Beard, G.S. Ford, L.J. Spiwak and M. Stern, *Social Well-Being and IP Theft: A Dynamic Economic Analysis*, PHOENIX CENTER POLICY BULLETIN NO. 32 (March 2012) (available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB32Final.pdf>).

⁴⁴ C.f., J.M. Urban, J. Karaganis, B.L. Schofield, *Notice and Takedown in Everyday Practice*, UC BERKELEY PUBLIC LAW RESEARCH PAPER NO. 2755628 (March 22, 2017) (available at: <https://ssrn.com/abstract=2755628>).

including the direct and indirect effects of infringing activity.⁴⁵ 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.⁴⁶ 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, the vetting of upload 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 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.⁴⁷ Evidence of direct financial benefit from the consumption of infringing

⁴⁵ T.R. Beard, G.S. Ford, M. Stern, and L. Stern, *Theft and Welfare in General Equilibrium: A Theoretical Note*, 2 THEORETICAL ECONOMIC LETTERS 470-473 (2012) (available at: <http://www.phoenix-center.org/papers/TheftandWelfareEconLetters.pdf>).

⁴⁶ N.D. Loris, *The Assault on Coal and American Consumers*, THE HERITAGE FOUNDATION BACKGROUNDERS NO. 2709 (July 23, 2012) (available at: http://thf_media.s3.amazonaws.com/2012/pdf/bg2709.pdf).

⁴⁷ See, e.g., M. Mulligan, STATE OF THE YOUTUBE MUSIC ECONOMY, MIDiA (June 2016) (available at: <https://www.midiaresearch.com/blog/the-state-of-the-youtube-music-economy>) (81% of YouTube viewers watch music videos, at p. 13); T. Ingham, *YouTube Earns \$9bn in Revenue Last Year, Towering Over Spotify*, MUSIC BUSINESS WORLDWIDE (January 5, 2016) (58% of YouTube viewing is music videos) (available at: <http://www.musicbusinessworldwide.com/youtube-will-earn-9bn-in->

works on a 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, that the “financial” considerations of Section 512 are binding in some respects, 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 PAPER, but already under consideration in the European Union. Though some details remained to be finalized, Article 13 of the *Digital Single Market 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-matter⁴⁸

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

[revenue-this-year-towering-over-spotify](#)); T. Spangler, *YouTube Standardizes Ad-Revenue Split for All Partners, But Offers Upside Potential*, VARIETY (November 1, 2013) (“the majority of YouTube’s user-generated content does not have advertising, so YouTube must recoup its costs from content that it can monetize”) (available at: <http://variety.com/2013/digital/news/youtube-standardizes-ad-revenue-split-for-all-partners-but-offers-upside-potential-1200786223>); B. Johnson, *Does YouTube Actually Make Any Money?*, THE GUARDIAN (April 6, 2009) (available at: <https://www.theguardian.com/technology/blog/2009/apr/07/youtube-video-losses>).

⁴⁸ *Directive Proposal*, *supra* n. 31.

responsible approach to detecting and addressing infringement, especially for intermediaries that provide “access to large amounts of works.”

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.⁴⁹

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.”⁵⁰ While it is difficult to predict the efficacy of these changes since they are not final or 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.

IV. 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. A significant influence 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 rightholders and, with regard to the CDA, human decency.

In this PAPER, we offer an economic model of safe harbors in an effort to help guide the reform of safe harbors. We find that the limits on liability afforded by safe harbor protection affects the evolution of platforms reliant on content posted

⁴⁹ *Id.* at 38.

⁵⁰ *Id.*

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.

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 by 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.